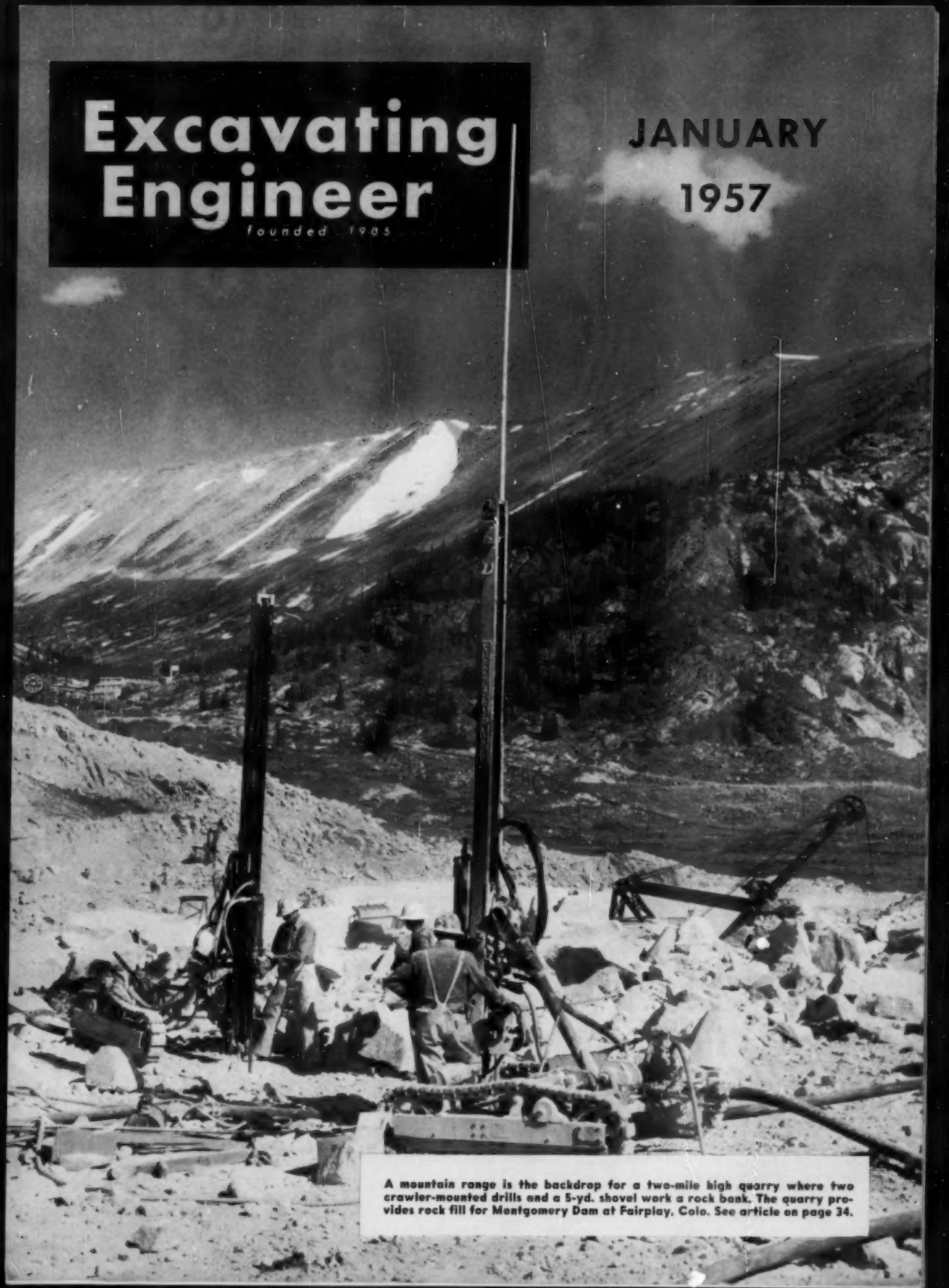
Excavating Engineer

founded 1905

JANUARY
1957



A mountain range is the backdrop for a two-mile high quarry where two crawler-mounted drills and a 5-yd. shovel work a rock bank. The quarry provides rock fill for Montgomery Dam at Fairplay, Colo. See article on page 34.

In Kentucky ...and the World Over

Bucyrus-Erie's Special Machines for Special Jobs Keep Operating Costs Low

At a large mining operation near Central City, Ky., two Bucyrus-Erie 190-Bs, specially built for the work they perform, are bringing new economies to open-pit coal removal.

Coal at this location occurs in two seams separated by a 4-ft. layer of clay and limestone, which must be drilled and blasted. This layer is being removed by a 190-B stripping shovel with 70-ft. boom and 6-cu. yd. dipper. Loading out coal from one of the seams has been assigned to a special 190-B coal loader equipped with 10-cu. yd. dipper.

Like other Bucyrus-Erie Ward Leonard electric shovels, these machines have the advanced-design features that mean high-output, low-cost performance month after month. Their modern front end design and heavy duty construction offer great strength while reducing power-wasting deadweight. Ward Leonard control permits rapid acceleration and deceleration for high-speed, coordinated operation.

Let us give you the facts on the 190-B and two other models — the 4½-yd. 110-B and the 6-yd. 150-B. Write direct for full information.

122157C

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110-B 4½-cu. yd.
150-B . . 6-cu. yd.
190-B . . 8-cu. yd.
BUCYRUS ERIE

BUCYRUS-ERIE COMPANY

SOUTH MILWAUKEE, WISCONSIN

Convert gravel pit to Drive-In theater site

Matched speed and traction of big rubber tires on pusher and scraper unit speeded up cycles. Single Tournatractor replaced 2 crawlers on this push-work.

Dallas movie-goers now watch current films at a new drive-in theater which was, until recently, a worked-out and abandoned gravel pit. Theater programs could read: "Earthmoving by George O. Walker Construction Co., Dallas, Texas".

Filling and leveling a gravel pit is a unique way to build a theater — but Texans like to do the unusual. So Walker moved in...loaded, hauled, and spread 120,000 yds. of sand and caliche to turn the irregular hole-in-the-ground into an attractive theater setting.

To move this yardage, Walker used a LeTourneau-Westinghouse team of 5 D Tournapulls and 1 208 hp rubber-tired C Tournatractor.

Filled from old spoil banks

Fill for the pit was obtained by cutting down most of the banks, together with old spoil piles on the property, to form a symmetrical amphitheater. First a dozer leveled off the steepest spoil ridges on the borrow section...then Tournapulls moved in for the king-size dirtmoving task.

Averaging 5-yd. loads per trip, the "D's" loaded on banks...hauled down into pit for spread. Returning, Tournapull operators handled their own haul-road maintenance, by dropping scraper's blade to smooth out haul route.

2,400-ft. cycle in 3 min. 22 sec.

On a cycle distance of 2400', "D's" averaged 3 min. 22 sec. Rigs loaded in 20 sec., over a 60' distance. Loaded Tournapulls completed 1120' haul in 1 min. 36 sec., returned in 1 min. 16 sec. Spreads over a 100' distance, took 10 sec.

Dirtmoving was done during the winter months, when rains and cold weather made work difficult. Yet Tournapull production remained steady under all weather conditions. When an unusual 4" snowfall hit Dallas, for example, it interrupted work for only half a day. When the storm was over, rigs had no trouble operating in snow.

Out-perform comparable scrapers

Superintendent J. K. Mason had this to say about his D Tournapulls: "In my opinion, Tournapulls will outperform any similar equipment on the market today. They will out-turn them, out-run them, and load faster! Anything you can get into a 'D' you can get out fast — and that's more than you can say for many other scrapers."

Owner George Walker found that his one Tournatractor handles the pushing job which formerly required 2 crawler-pushers. "This rubber-tired tractor is much less expensive to operate than crawlers," he stated. "Maintenance and upkeep costs, both for D Tournapulls and Tournatractor, are low."

Now 9 yards heaped

The improved D 'Pull, now available, has 7.3 cu. yds. struck capacity and 9 cu. yds. heaped. With its narrow 8' width, and axle-loads within allowable weight limits, rig is roadable without special permit. Write for details. Find out how this machine can make profits for you.

Tournapull, Tournatractor—Trademark Reg. U.S. Pat. Off. DP-1038-8-b

120,000 yds. of sand and caliche were moved in 60 days to transform gravel pit into amphitheater for a drive-in theater at Dallas, Texas. Work-team included 5 Tournapulls, 1 Tournatractor, and 3 crawlers.

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS
A Subsidiary of Westinghouse Air Brake Company
WHERE QUALITY IS A HABIT

Eimco 105 Front End Loader With 40,000 lb. Breakout Power

In broad usages such as loading in mines where low ceiling prevents overhead discharge . . . razing brickwork in open hearth furnace slag pockets . . . cutting smooth grades where fine control is required . . loading into haulage equipment where high discharge is necessary . . . loading into light units or handling fine, dusty and wet material where controlled discharge is desirable . . . loading around wharves, docks, railroad yards (with fork lift attachments) . . . the 105 fills industry's requirements for a rugged, extra heavy-duty front end loader.

NOW! EIMCO HAS TWO RUGGED LOADER ASSEMBLIES

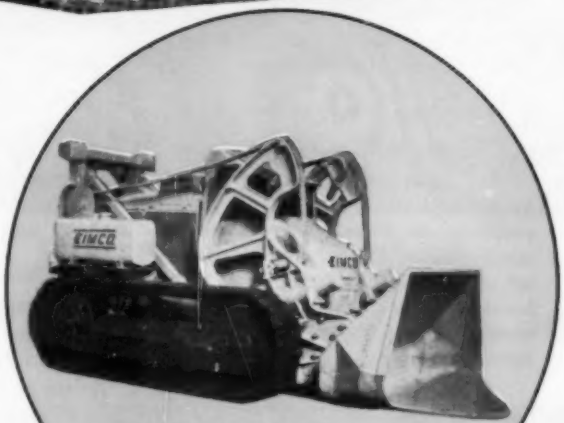
Productive scope of the Eimco 105 Crawler-Tractor has been broadened again by development of a heavy-duty Front End Loader.

For the first time, this provides the earth-moving industry with a machine that can utilize two unique loading attachments . . . each employing entirely different operating principles for jobs where physical conditions make the use of one advantageous over the other.

Since introduction of the 105, heavy construction industries in all parts of the world have praised the digging and loading speed of Eimco's rugged Rocker Arm Excavating Loader.

Like this and all Eimco equipment, the Front End Loader reflects years of constant development combining research with practical field experience.

Exclusive features of the hydraulic system provide an extra margin of protection against mechanical delays and the torque converter transmits maximum power from engine to boom and bucket cylinders for powerful digging effort at the bucket lip.



EIMCO 105 EXCAVATOR

All attachments (including bulldozer assemblies) are Eimco-built to standard SAE mounting dimensions for the basic 105 Tractor. This means that you get extra performance from every attachment through operating ease, maneuverability and visability . . . permits you to increase your earning potential without the addition of specialized machinery.

Each of these dirt-moving tools gives you new production and profit opportunities well worth investigating. Do this today by writing The Eimco Corporation for full particulars.

THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

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B-236

Advertisers

IN THIS ISSUE

Allied Steel & Tractor Products, Inc. 57
Allis-Chalmers Mfg. Co. 37–40, 52–53
American Road Builders' Assn. 66–67
Bethlehem Steel Co. 16
Bucyrus-Erie Co. Cover II, 5–10, 50
Buda Div., Allis-Chalmers Mfg. Co. 52–53
Caterpillar Tractor Co. 13, 14–15, Cover IV
Colorado Fuel & Iron Corp. 61
Drake-Williams Mount 65
Eimco Corp., The 2
Ensign-Bickford Co., The 47
Erie Strayer Co. 70
Euclid Div., General Motors Corp. 22–23
For Sale (Classified) 71, 72
General Motors Corp., Euclid Div. 22–23
Harnischfeger Corp. 48–49
Hayward Co., The 68
Hendrix Mfg. Co. 12
Hercules Powder Co. Cover III
Hough Co., The Frank G. 58–59
International Harvester Co. 62–63
Kiesler, Jos. F. Co. 56
LeTourneau-Westinghouse Co. 1, 11, 69
Mack Trucks, Inc. 18–19
Manitowoc Engineering Corp. 17
Marion Power Shovel Co. 20
M-R-S Mfg. Co. 4
Rockwell Engineering Co. 51
Roebling's Sons Corp., John A. 61
Salem Tool Co., The 54
Sauerman Bros., Inc. 55
Timken Roller Bearing Co., The 21

Excavating Engineer

founded 1905

CONTENTS

Volume 51 No. 1 **January, 1957**

Turnpike Serves Population Areas 24
Connecticut's 129-mile toll road will pass through New Haven, Bridgeport, Stamford.

Delivery by Rocket 30
Minneapolis truck-transfer outfit has reputation for fast, efficient hauling. Runs own fleet of rubber-mounted cranes to speed customer service and handle digging and lifting jobs.

Rock Dam in the Rockies—by Ray Day 34
Fisher Contracting Co. encountered hard rock, ground water, a short working season and a two-mile high altitude in constructing an 800,000-yd. rock dam structure near Fairplay, Colo.

Dredges Place Highway Fill 44
New 21-mile section of U.S. Route 51 is being built to replace highway that has been in use 40 years. Hydraulic fill is being used. Job also includes a 3,012-ft. high level bridge.

News from the Field 46

Asphalt Canal Lining 46
Announce Moles Awards 50
Safety-Minded Reader Writes 51
Equipment Distributors Meet 51
Beavers Hold Awards Event 51

Obituary—Robert M. Reindollar 51

Equipment You Ought to Know About 54

New Trade Literature 70

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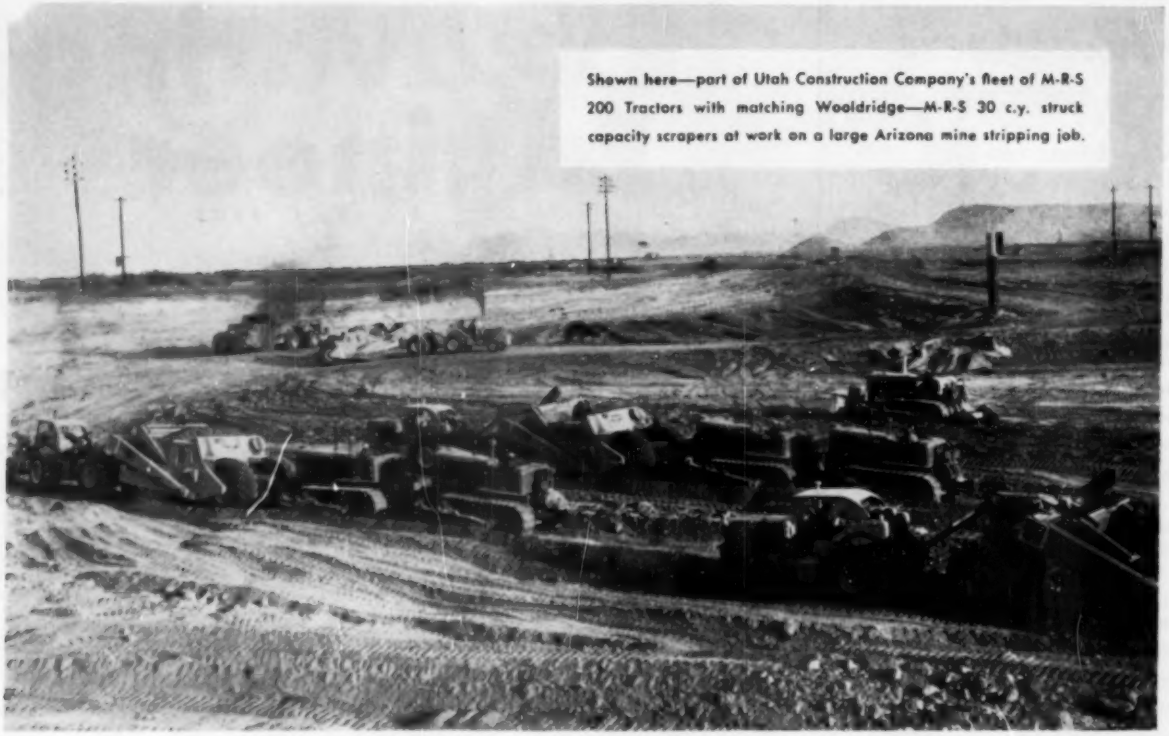


Shown here—part of Utah Construction Company's fleet of M-R-S 200 Tractors with matching Wooldridge—M-R-S 30 c.y. struck capacity scrapers at work on a large Arizona mine stripping job.

UTAH CONSTRUCTION COMPANY UPS PRODUCTION WITH M-R-S BIGGER CAPACITY!

After investigating the advantages of M-R-S bigger capacity, **Utah Construction Company** chose M-R-S tractors and matching Wooldridge — M-R-S scrapers for this tough multi-million yard Arizona mine stripping job.

Even in hard, dead Caliche with most of the loaded haul up grades that increased as the job progressed, Utah Construction Company kept production ahead of schedule . . . set new production standards with ten 335 H.P. M-R-S 200 Tractors and matching Wooldridge — M-R-S **30 c. y. struck,** 39 c.y. heaped capacity scrapers.

M-R-S Tractors, with exclusive **Weight Transfer,** have the extra power and tractive ability to help the push tractor secure heaping loads in minimum time and distance even in the hard loading material encountered on this job.

The exclusive M-R-S four axle design provides greater hauling capacity at faster usable speeds for more cycles per hour. Add to these advantages the easier maneuverability, high level of mechanical dependability, and extra profitable versatility and you'll see why more and more contractors are turning to M-R-S . . . the earth-moving equipment of the future ***available for you today!***

SEE BIGGER CAPACITY M-R-S EQUIPMENT AT THE I.R.B.A. ROAD SHOW, CHICAGO, JANUARY 28-FEBRUARY 2, 1957.

Investigate Before You Invest!

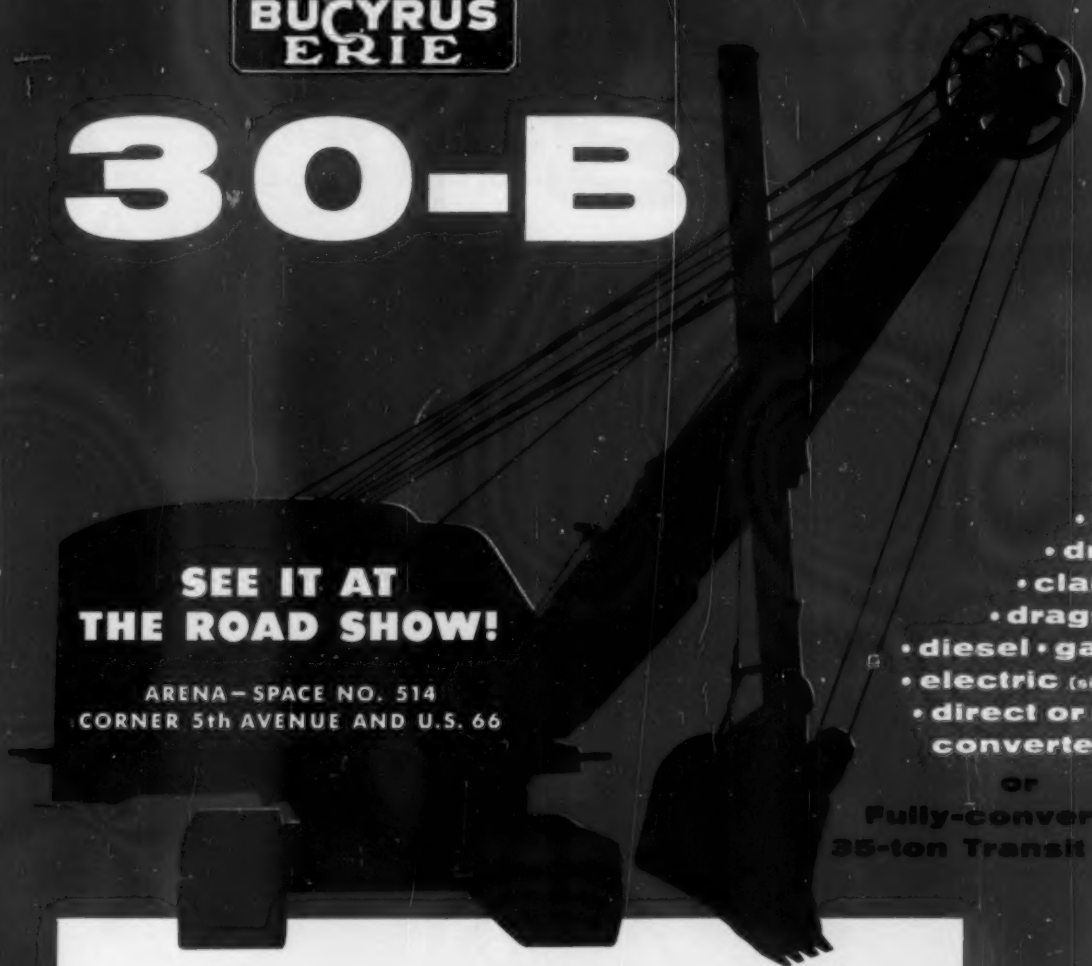
THE EMBLEM OF DEPENDABILITY M-R-S MANUFACTURING COMPANY

FLORA, MISSISSIPPI, U. S. A.

it's here!

BUCYRUS ERIE

30-B



SEE IT AT THE ROAD SHOW!

ARENA – SPACE NO. 514
CORNER 5th AVENUE AND U.S. 66

- crane
- shovel
- dragline
- clamshell
- dragshovel
- diesel • gasoline
- electric (single motor)
- direct or torque converter drive

or

Fully-convertible 25-ton Transit Crane

Here's a brand new 1-yd. profit maker for you — the Bucyrus-Erie 30-B. A companion to the highly popular ½-yd. 15-B and ¾-yd. 22-B machines, the completely new 30-B gives you all of their outstanding advantages *plus* a big lineup of new features of its own. (See the following pages for full details.)

Offered with either crawler or rubber-tired carrier mounting, the new 30-B is readily convertible to various front ends — shovel, dragshovel, dragline, crane, or clamshell. Extensive tests conducted at Bucyrus-Erie's research grounds near South Milwaukee and on actual construction jobs have proved it to be a stalwart performer on any type of excavating or lifting crane job, packing speed and efficiency into whatever work it handles.

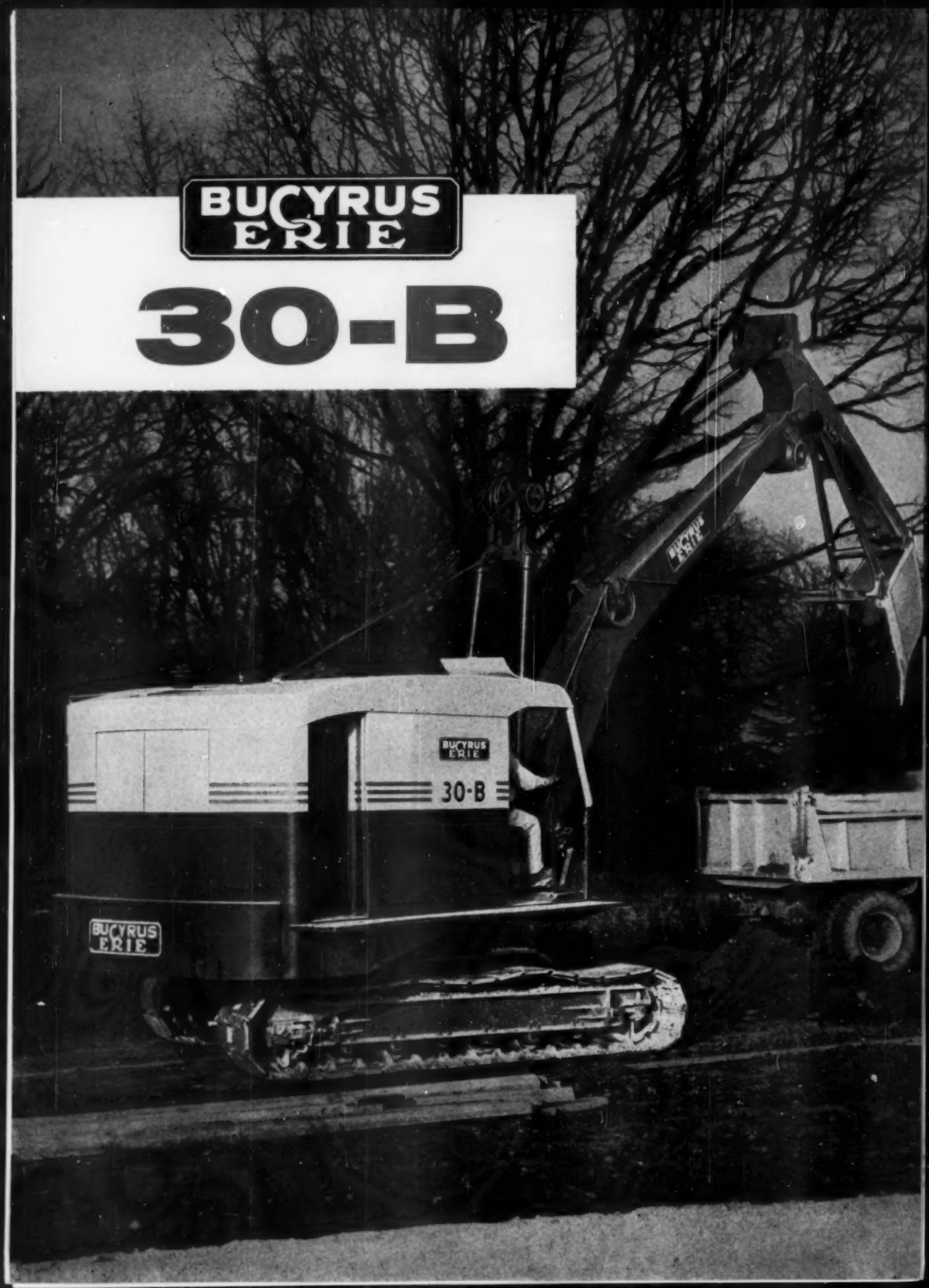
New . . . fast . . . quality-built, the 30-B is just what you need in a 1-yd. machine to put you in good position in the busy construction season ahead!

208E56C

more—

BUCYRUS ERIE

30-B



Matched to your needs

Either direct or torque converter drive — whichever best fills your requirements.

Five front ends, easily converted—main machinery arrangement simplifies conversion to shovel, dragshovel, crane, dragline, clamshell to fit the job.

Your choice of five crawler mountings—standard length frames with either standard width or narrow width treads; long frames with narrow, standard or wide treads; plus Transit Crane on rubber-tired carrier.

Extra equipment for special jobs — independent propel, third drum unit, cathead, power controlled load lowering on main hoist line, and various-length crane booms and jib extensions.

. . . sets new performance standard in the 1-yd. class

Designed to out-perform

Easy, air control — hoist, crowd or drag, swing or propel, and steering clutches, as well as digging and swing brakes and dipper trip, are air-controlled and operated. Controls are accurate, conveniently placed, easy to operate.

Minimum time for servicing — easy access for maintenance; automatic lubrication of many parts; special system, with remote control located at operator's position, for greasing swing pinion and rack; grease fittings grouped to save time; adjustments quickly made, infrequently needed.

Strong, simple construction — parts are large, simple, few in number; provide strength needed for effective working, keep the machine on the job.

Built to last

Six conical hook rollers — two equalized pairs in front, two singles in rear distribute loads evenly between upper and lower works, save wear.

Large, cool-running clutches and brakes — assure longer life. Five main operating clutches are alike, with parts interchangeable.

Specially processed steels — add strength and wear resistance. Care in manufacturing pays off in extra years of machine life.

Strong, rigid cast steel revolving frame — built to withstand twisting and bending stresses — provides firm base for main machinery, maintains alignment to minimize wear.

207E56C

more →

look at the BUCYRUS ERIE

30-B

. . . feature by feature!

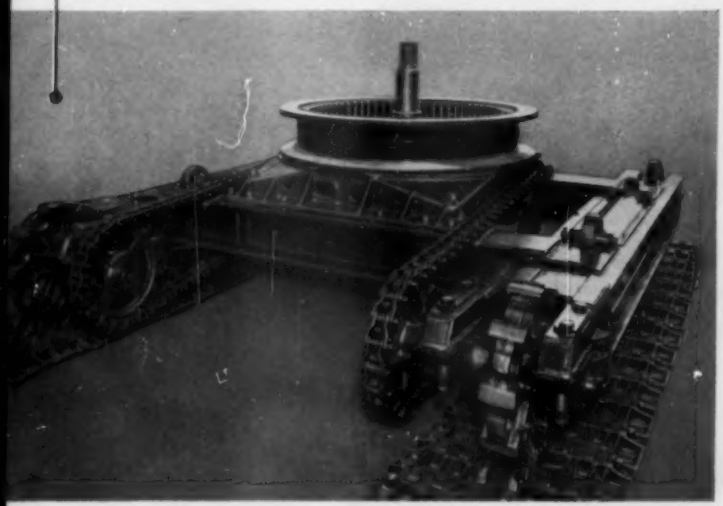
SEE WHAT MAKES IT THE 1-YD. MACHINE FOR YOU

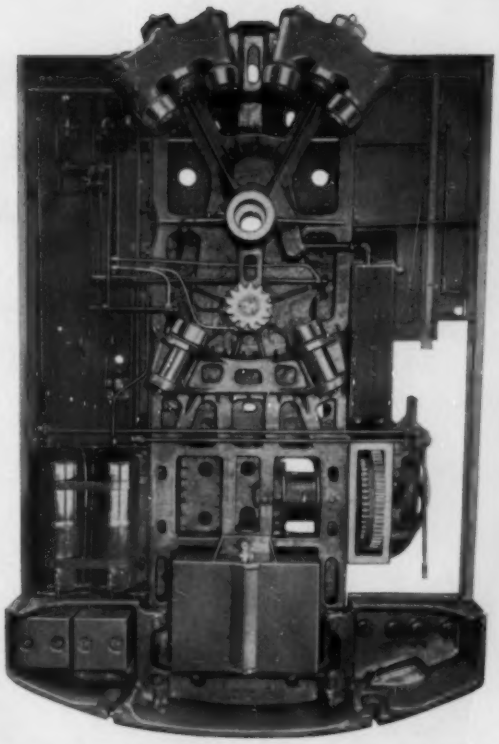
Quick convertibility — Special arrangement of main machinery makes it easy to convert from shovel to crane, dragshovel, dragline or clamshell and save time doing it. Boom lengths from 40′ (standard) to 100′ (with removable inserts) can be handled by the 30-B crawler crane, booms to 130′ long available for the Transit Crane. Raising and lowering of the boom is power controlled, fully independent of all other functions. Dragline is equipped with full rotating fairlead. Auxiliary A-frame has a telescopic strut which prevents "kicking back" when digging trench on steep grades with dragshovel.

Strong, light-weight shovel front end with twin-rope crowd — 30-B boom design puts strength where you need it, keeps out deadweight. The dipper handle does not touch the boom, and the heavy-duty saddle block transmits loads to the sturdy box-section lower boom. The lighter weight upper boom section takes rope loads only. This design saves power, makes rapid deceleration and acceleration possible, with less wear and tear on deck machinery. Positive, independent twin-rope crowd is coordinated with swing and hoist to reduce cycle time, increase output. Twin ropes handle crowd action, while one handles retract. Retract speed is extra fast — 1½ times the crowd-out speed.

Easy, sure control for big-output working cycles — Controls are located so that they can be conveniently reached by the operator. Controls for the main functions — hoist, crowd or drag, swing or propel, and steering clutches, as well as digging and swing brakes and dipper trip are air controlled. They respond quickly to operator's touch to provide accuracy and speed of operation. Operators can work a full shift without unnecessary fatigue to reduce their efficiency.

Sure, stable mounting — The strong, rigid single cast steel truck frame provides ruggedness for tough digging and travel over rough terrain. Steering is smooth and easy. Friction-type steering brakes and multiple jaw propelling clutches are spring-set and air-released. You have a choice of five crawler mountings. Standard length frames are available with either standard width or narrow width treads. Long frames with narrow, standard, or wide treads are also available. For rubber-tired mobility, the 30-B is also offered as a Transit Crane.





Strong, rigid cast steel revolving frame — The one-piece cast-steel frame of deep box section design provides a light-weight yet strong, rigid base that holds main machinery firmly in alignment. Loads are distributed evenly between upper and lower works by six conical hook rollers — two equalized pairs in front and two singles in the rear — that eliminate skidding and provide smooth rolling.

Smooth, direct power flow through simple main machinery — Power goes to work smoothly, through a minimum of parts, to give you the most effective power transmission. Engine transmission chain, boom hoist chains and sprockets, and every gear and pinion (except swing pinion and rack which are lubricated through a special system with remote control located at operator's station) are fully enclosed and run in oil bath. All parts not operating in oil are greased through conveniently grouped lube points.

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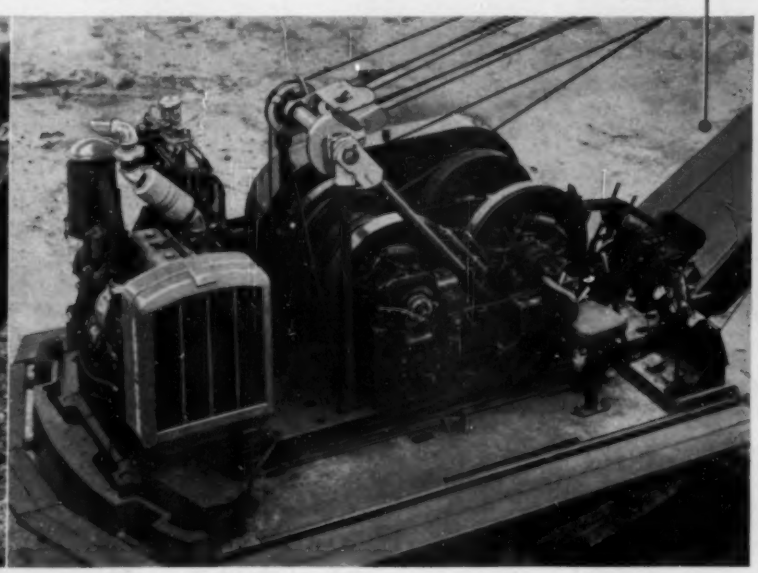


USE REPLY COUPON
ON NEXT PAGE

30-B
TRANSIT CRANE

gives you big capacity *plus* maximum mobility, convertibility

Outstanding advantages of the crawler-mounted 30-B plus the mobility of a rubber-tired carrier — that's the new Bucyrus-Erie 30-B Transit Crane. It is convertible to five front ends — crane, shovel, dragline, dragshovel, clamshell. Mounted on a welded all-steel carrier built to Bucyrus-Erie's own specifications, the 30-B Transit Crane is a unit that can be depended upon for all types of heavy-duty lifting and digging jobs.

see your Bucyrus-Erie distributor NOW

Your Bucyrus-Erie distributor has all the facts on the new 30-B — will be glad to explain its many outstanding features. Or, if you prefer, send in the coupon below for complete details. If you need a true, modern 1-yd. machine, be sure you investigate the new Bucyrus-Erie 30-B.

209E56C

South Milwaukee, Wisconsin

BUCYRUS ERIE

BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin

Gentlemen: Please send me details on the new 30-B.

Name _____

Organization _____

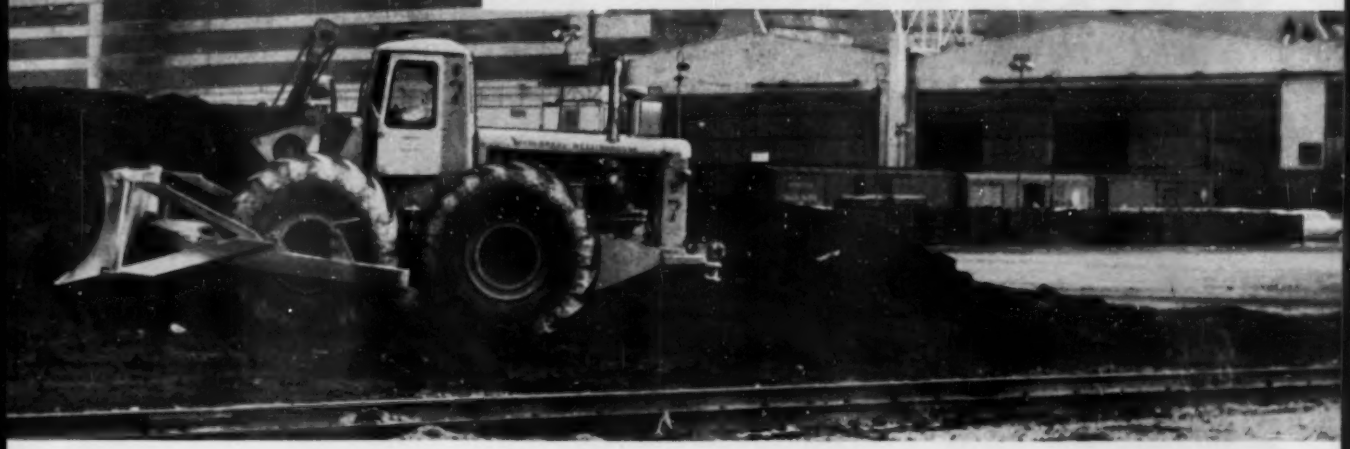
Address _____

City _____ State _____

209E56C

send for complete facts

Ford —— uses TOURNATRACTOR for heavy dozing at Rouge Plant



Ford Motor Company uses a high-speed Tournatractor for heavy, widely-scattered miscellaneous dozing jobs at its Rouge Plant, Dearborn, Mich. Tournatractor is the only rubber-tired heavy-duty tractor in the big fleet of Ford's Transportation Dept., Manufacturing Service Division. It trouble shoots on big dozing jobs that pop up suddenly and have to be handled fast.

Tournatractor's top speed of 17 mph gives it a big advantage over slower vehicles of similar purpose. It travels under its own power to widespread jobs. No trailer is needed — resulting in cost and time savings. Big, low-pressure tires do no damage to pavements and curbs... resist wear from uneven footing, abrasive materials.

On call 24 hrs. a day

Most runs around Ford's Rouge Plant are from 0.5 to 4.0 miles from operating center. Furthest distance of travel outside plant proper is 7 miles. Tournatractor is on call for work assignments 24 hours a day.

Rouge Plant also uses 4 crawler-tractors on assigned operations as well as Ford farm tractors for light materials handling.

Big jobs are widely-spaced

Major repeat jobs handled by Ford's Tournatractor are piling and cleaning up limestone stockpile at steel mill, stockpiling flue-dust prior to removal for sintering operations, cleaning up at steel turnings stockpile, and dozing at a refuse dump. Tournatractor works at widely-spaced locations on the 1200-acre Rouge Plant property, and sometimes on company-owned land-fill refuse-dumps outside the Rouge Plant proper.

In one typical summer month, Ford's fast-moving Tournatractor did all these jobs: pushed limestone at a dock, cleaned up dirt at a parking lot on the river front, dozed ore at the river dock, cleared out mud at another parking lot, stockpiled flue-dust. It backfilled earth and dozed slag at the Fairlane estate outside of the plant, stockpiled coke and iron-ore, worked refuse at the Oakwood dump outside the plant, and dozed coke at the boat dock on the river's edge.

Low maintenance costs, simple lubrication

Maintenance cost is low with Tournatractor. Rolling on four wheels and tires, rig shows little wear under daily operating conditions. Moving parts of tractor are built big and tough. Lubrication is simple, too. Many owners report that less time is required for greasing Tournatractor than for other tractors in its work class. It has few lube points.

Ford's Tournatractor is equipped with a heavy-duty, 13′ wide dozer blade for dozing. Operator raises, lowers, and tilts blade instantly with simple finger-tip electric controls.

Ask us to show you other owner-verified reports on Tournatractor performance in the industrial field. This powerful rubber-tired machine will pay for itself fast on any job where heavy-duty dozing over a wide operating area is needed.

Tournatractor travels swiftly from yards, to docks, to off-property locations. Unprotected rail tracks, uneven surfaces, are no obstacle to this speedy, heavy-duty dozing unit.

Tournatractor—Trademark Reg. U.S. Pat. Off. T-1008-JS-b

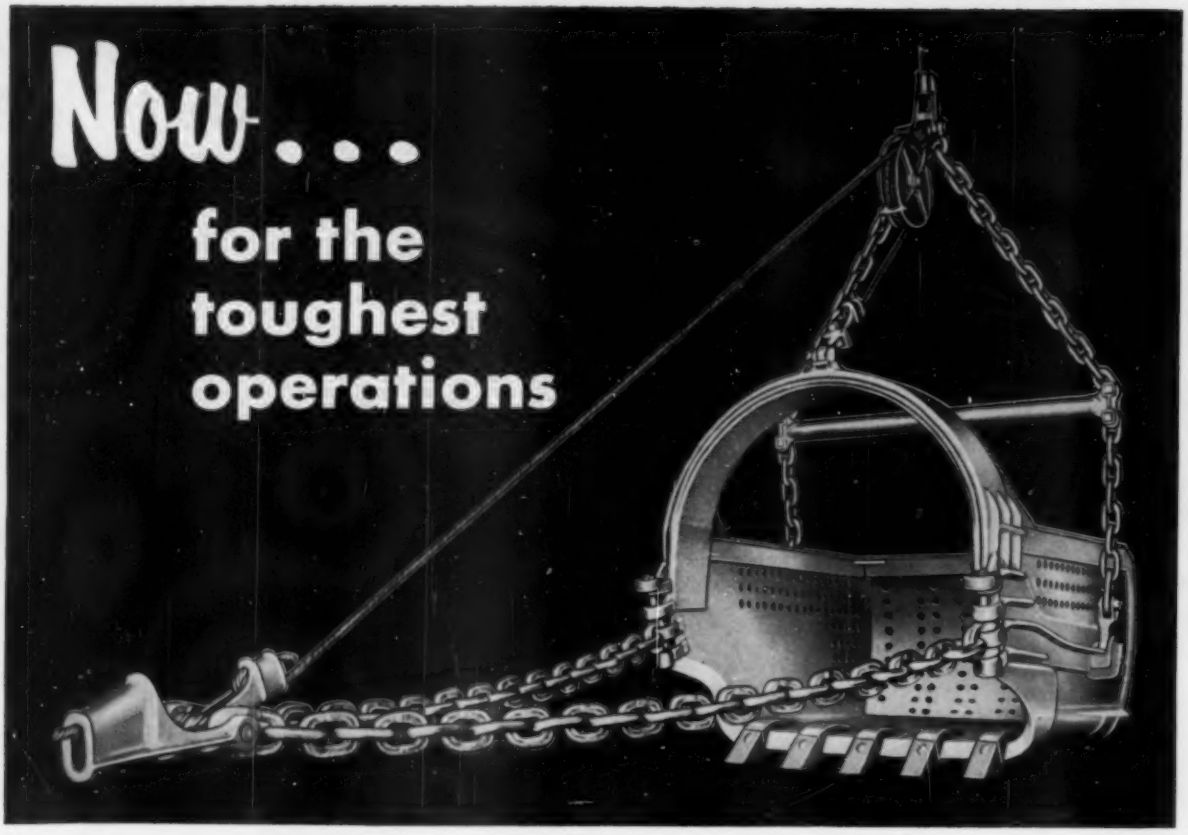
LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

WHERE QUALITY IS A HABIT

Now . . .

for the toughest operations



the new "MH"

HENDRIX

Heavy Duty Mining Bucket

now there are . . .

4 TYPES

designed for every digging purpose

"LS"

"TS"

"HS"

and the new

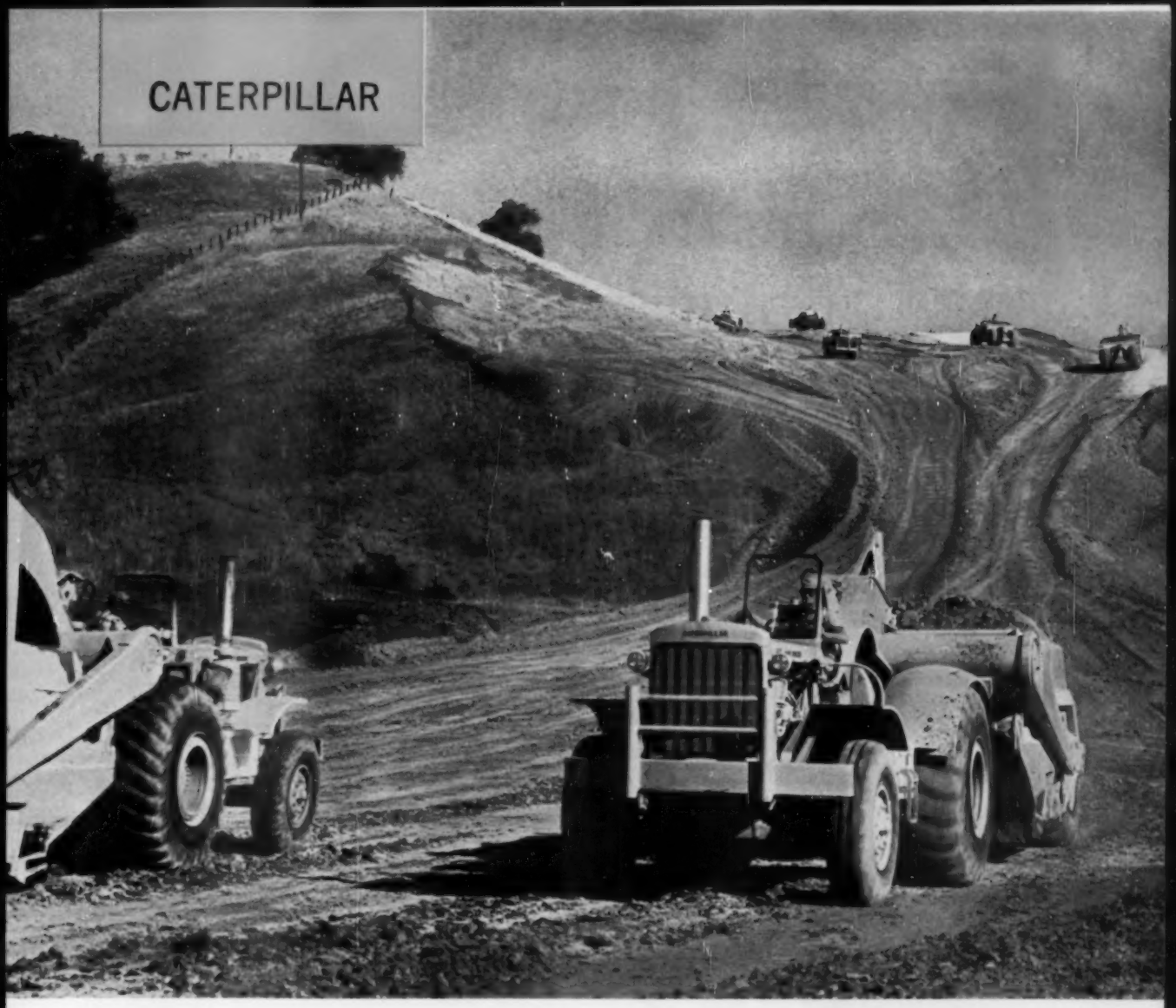
"MH"

Designed to meet the problem of rising stripping costs, the new Type "MH" Hendrix is engineered and built to take the abuse of the most rugged stripping conditions. Like all other Hendrix Buckets, the Type "MH" assures GREATER PRODUCTION at the lowest cost-per-yard for MORE PROFITS on every job.

HENDRIX MANUFACTURING CO., Inc.

MANSFIELD, LOUISIANA

Hendrix Lightweight Dragline Buckets



THE ROAD AHEAD

America's new highway program is a 50-billion-dollar challenge to the nation's road builders. Success of the greatest building project ever conceived by man rests with them alone

America has handed the new Federal-aid highway building program to the nation's road builders with complete confidence.

In the next 13 years, the U.S.A. will spend 50 billion dollars building Federal-aid roads alone. From the program will rise a magnificent 41,000-mile system of Interstate Freeways. It totals up to the greatest building project in history.

Only this nation could have the vision for such a program. For only America has the need for it . . . and the resources to see it through to completion. And only America—unawed by bigness—could start such a program without a doubt of its success . . . a magnificent tribute to the nation's road builders.

But make no mistake about it. This is a 50-billion-dollar challenge. It will take co-ordination, co-operation, and the combined experience of the nation's contractors, engineers, Federal and State road officials, bankers, material producers and equipment manufacturers. They start with the nation's confidence. Will they be able to hold it on the long road ahead? The next two pages will give you a clue.

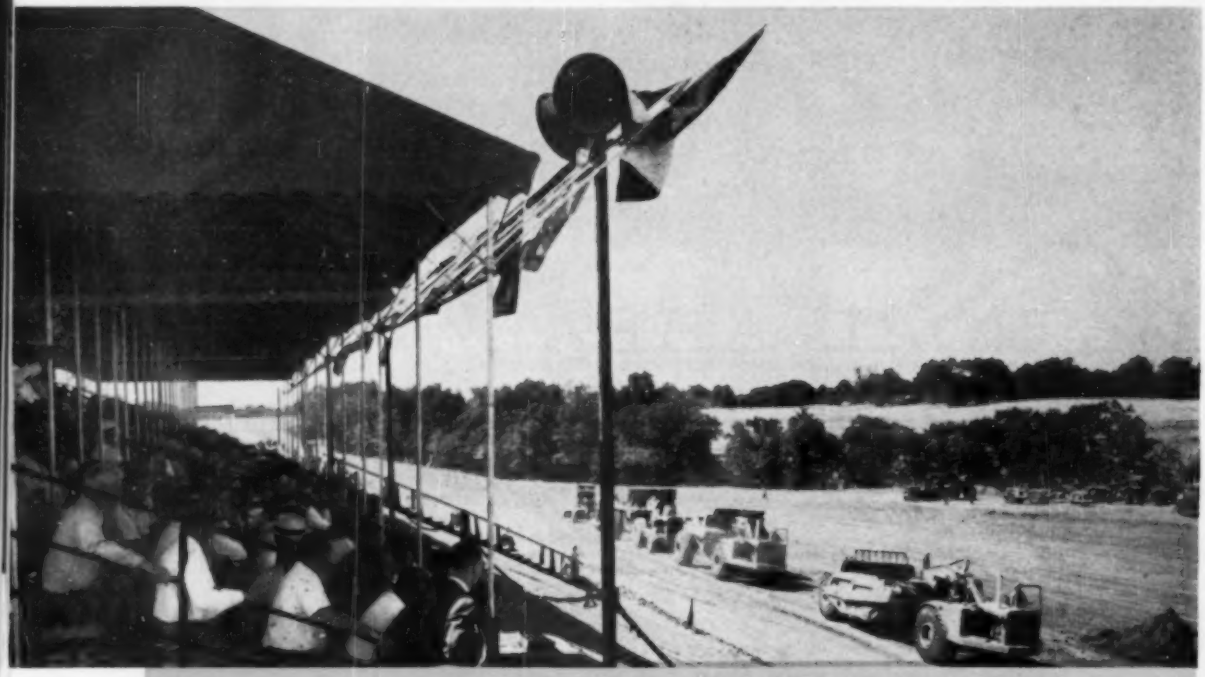
CONTINUED

ROAD BUILDERS RISE TO THE CHALLENGE BY WORKING TOGETHER AS NEVER BEFORE

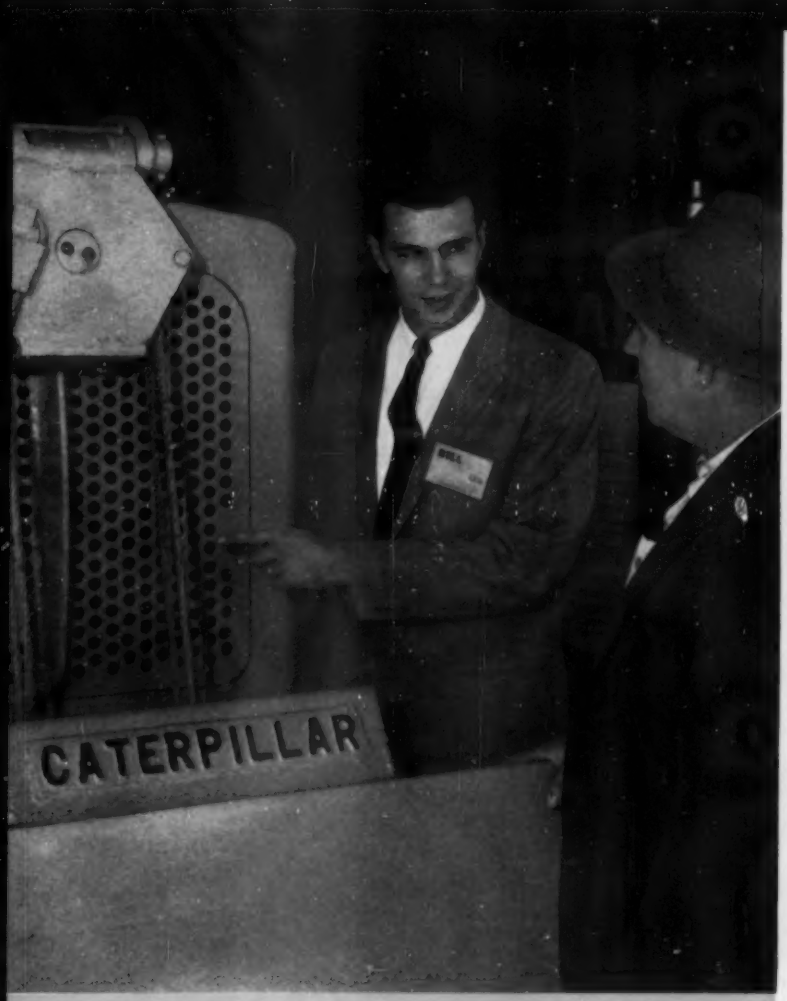
The key to America's fabulous road-building program is co-operation. The men who must make it work are a diversified group—bankers, engineers, contractors, government officials, materials producers, equipment manufacturers. But they are united today by *one goal* and are setting an example of industry co-operation rarely equaled. Here are some examples of how an equipment manufacturer is co-ordinating its activities with all other groups.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

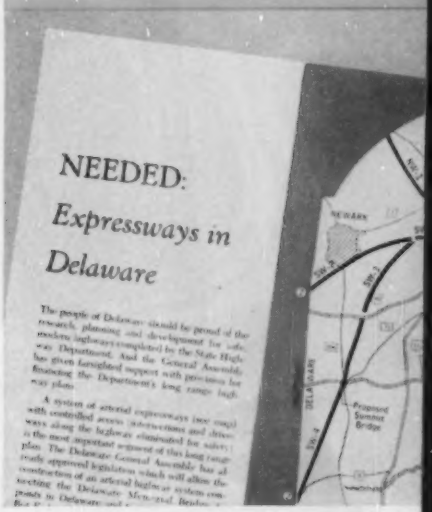


BANKERS AND EQUIPMENT MANUFACTURERS. Some 180 bankers from every sector of the U.S.A. view the latest earthmoving equipment at the world-famous Caterpillar proving ground in Peoria. A two-day program gives them a close-up of new and improved CAT* equipment—like the giant D9 and the new DW21 with its high-capacity LOWBOWL Scraper—which they finance for contractors. A show like this bolsters confidence—makes credit easier.



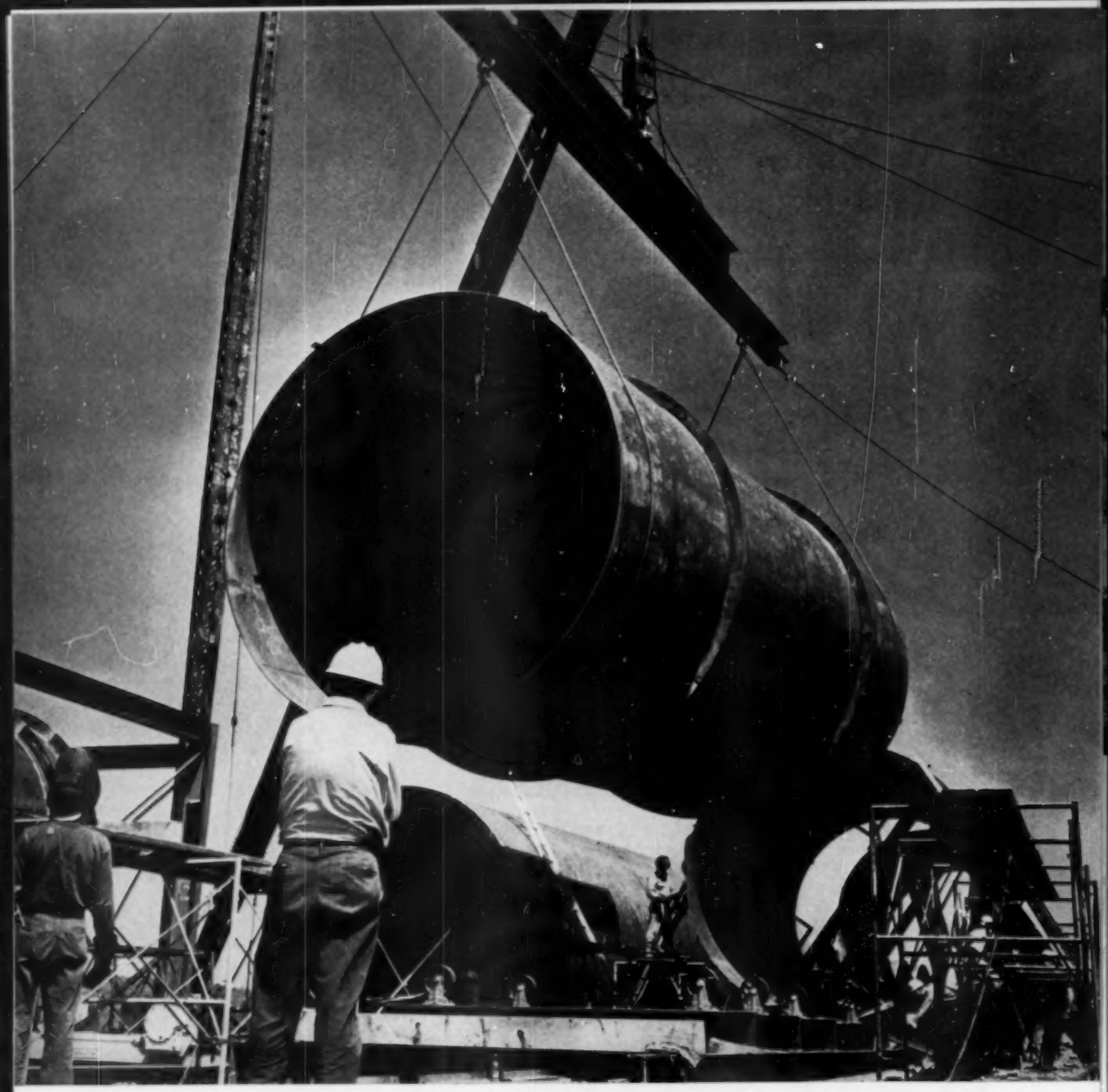
CONTRACTORS, GOVERNMENT OFFICIALS, MATERIALS PRODUCERS AND EQUIPMENT MANUFACTURERS. The 1957 Road Show in Chicago this month will demonstrate to contractors, government officials and materials producers that the equipment is ready for the job ahead. Caterpillar's exhibit will feature the new road program in detail and will spotlight the machines on which contractors will depend to accomplish the job.

STATE OFFICIALS AND EQUIPMENT MANUFACTURERS. This Caterpillar leaflet helped road officials in Delaware get important limited access legislation approved. Caterpillar first featured Delaware in a national advertisement, then local Caterpillar Dealers sent reprints like this to legislators and other interested persons in the state explaining the need for limited access legislation. Bill passed soon after.


NEEDED:

Expressways in Delaware

ENGINEERS AND EQUIPMENT MANUFACTURERS. Exhaustive on-the-job tests are made on newly designed equipment to help engineers figure capacity, speed of production. Engineers base their estimates and contracts on the known production capabilities of machines—they depend on those machines to perform with minimum down time. Here the Caterpillar DW21 Tractor with No. 470 LOWBOWL Scraper helps meet the engineers' challenge on the Florida Turnpike.



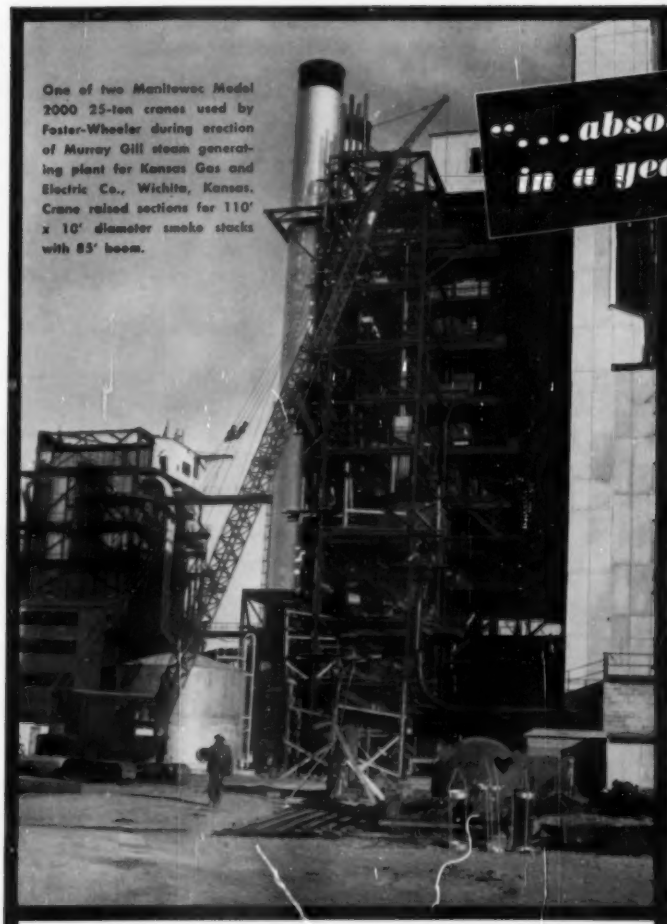
Wire Rope at Work—At Hawley, in the beautiful, rolling Pocono Mountains, is a big hydroelectric plant operated by the Pennsylvania Power & Light Company. Thirty or more years ago, PP&L constructed a wood-stave flow line connecting the plant to the Lake Wallenpaupack dam, 3½ miles away. Approximately 8500 ft of this system was recently replaced with a huge steel pipe line, 14 ft 8 in. in diameter. The photograph shows one stage of construction work.

Lifting the ponderous fabricated pipe was a job in itself. But with Bethlehem wire rope handling the principal lifts, the task of moving the heavy sections was managed smoothly. It was the type of job that this strong, tough rope always takes in stride, no matter how heavy or cumbersome the load.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:
CONSTRUCTION • EXCAVATING • MINING • QUARRYING • PETROLEUM • LOGGING • MANUFACTURING

BETHLEHEM WIRE ROPE
BETHLEHEM STEEL



One of two Manitowoc Model 2000 25-ton cranes used by Foster-Wheeler during erection of Murray Gill steam generating plant for Kansas Gas and Electric Co., Wichita, Kansas. Crane raised sections for 110' x 10' diameter smoke stacks with 85' boom.

"...absolutely no maintenance in a year-and-a-half..."

Manitowoc crane is "perfect"
. . . says Field Superintendent

"As far as Manitowocs are concerned, I'd rather use them than any crane I've come in contact with!" That's Mr. S. C. Townsend, a Field Superintendent for the Foster-Wheeler Corp., referring to a 25-ton Manitowoc Model 2000 crane he uses — one of 30 Manitowocs owned by Foster-Wheeler. Here's more sincere praise Mr. Townsend has for Manitowoc cranes . . . "They never have given us any trouble. My operators say they are the easiest on the market to operate. Manitowocs seem to have plenty of horsepower for anything we attempt to do. One of the 2000 machines has had absolutely no maintenance on it, except to change oil, in the year-and-a-half we have owned it. It has been perfect. I appreciate the fast, courteous service I get from Manitowoc."

Why not put a Manitowoc to work on *your* next job? A phone call to your helpful Manitowoc distributor will bring full details and specifications. Contact him *now* before your next important bid!

Manitowoc Engineering Corp. Manitowoc, Wis.

"...easiest to operate..."

Disc type swing and travel clutches give smooth, pin-point control without grabbing or jerking. Optional air controls and power-smooth torque converter make any Manitowoc the "operator's friend".

"...plenty of horsepower..."

Simplicity of main machinery design adds horsepower where it's needed. Just 13 gears and pinions in the Model 2000 machine . . . only working gears turn. Exclusive sliding pinion arrangement uses only one set of clutches to drive travel, swing and boom hoist.

"...never any trouble..."

Finest quality construction with special alloy steels used at all points of greatest wear. Maintenance is easy for simple servicing in the field with minimum downtime.

"...fast, easy convertibility..."

Conversion to 1¼-yd. shovel and trench hoe, and long-reach dragline is quick and simple with same back hitch arrangement. Except for drum laggings, all changes need only pin connections.

MANITOWOC

SHOVELS 1-5½ YD. Speedcrane CRANES 20-100 TON

Macks ARE HANDLING THE IMPORTANT JOBS

building the National Highway System!

The road boom's underway! Up to 33 billion dollars worth of new highways to be built. And right now, you're probably asking yourself:

"What kind of hauling equipment will net me the greatest return?"

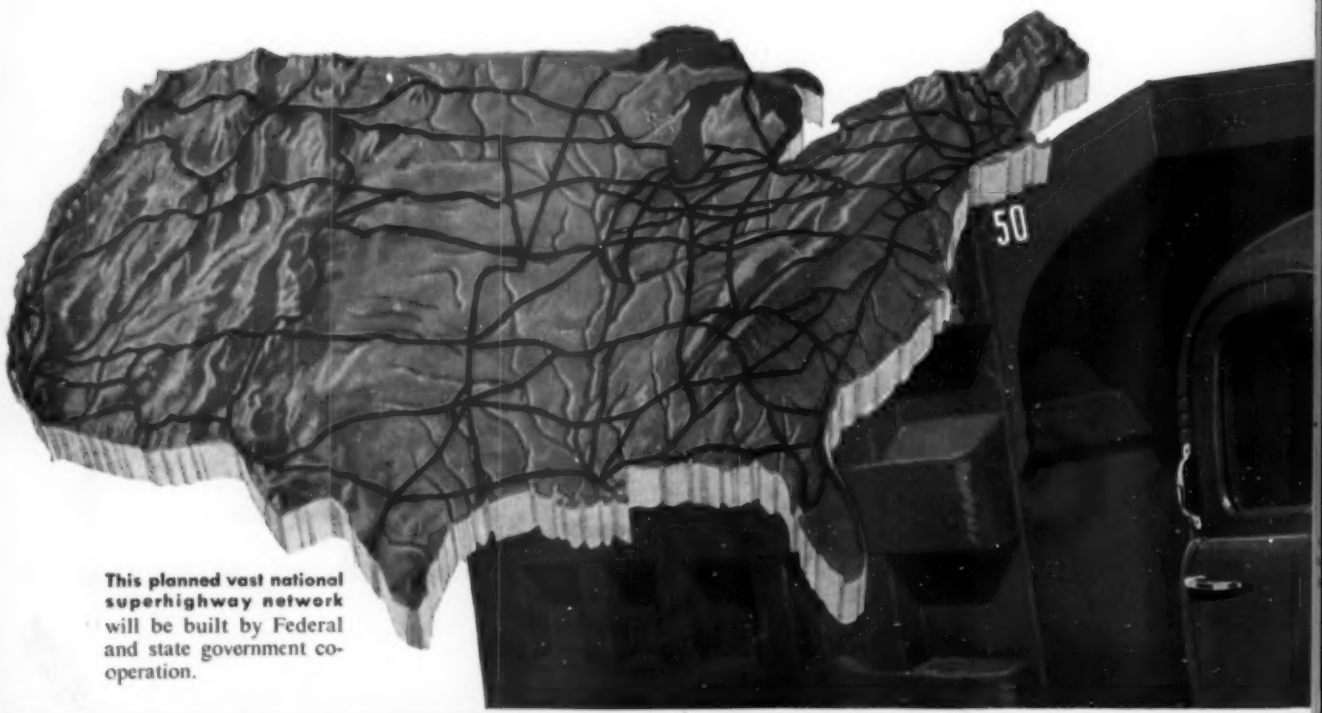
For the best answer . . . ask any of the thousands of construction firms that have learned to rely on Macks. They'll tell you that their best investment is the kind of equipment that can handle the most punishing loads over the worst terrain and footing without losing precious contract hours for overhaul or repair.

And they'll tell you—*Mack's got it!* Got it in the powerful dependability of the famous Mack engines. Got it in the famous Mack Balanced Bogie with the exclusive Power Divider that allows Macks to move in and work where other trucks bog down. In the many, many other features that have made "Built like a Mack" a trade term for the utmost in stamina, dependability and strength.

Best of all—there's a Mack for every important hauling job. Take a look soon at the Mack 4- and 6-wheel haulers, dumpers and concrete-mixer models . . . with capacities up to 34 tons. You'll quickly see why, wherever you see important work, you'll generally see Macks in action. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

Mack

FIRST NAME FOR TRUCKS



This planned vast national superhighway network will be built by Federal and state government co-operation.

B63 Mack
Diesel
Thermodyne
Mack
Mack
woody

Wrecking the Old to Erect the New

Speeding Feed Mill Project in Virginia

A 25-ton Marion 35-M Truck Crane and a 35-ton Marion 43-M Truck Crane brought down the house with stellar performances as they wrecked a hopper bin tower to make way for a new half-million dollar feed mill in Richmond, Virginia.

That's the 35-M in the foreground, working in really cramped quarters on one of its first jobs. There is no turning space and the 75' boom is extended over a set of high tension wires. The operator starts a lift, then booms nearly straight up to get the load down behind the wires.

When the 43-M Truck Crane in the background came onto this job, it had already proved its versatility on a variety of other heavy work in the Richmond area.

Whether you're tearing down an old structure or erecting a new one—a Marion Truck Crane can help you do the job faster and more efficiently. See your Marion distributor for the full story about these mobile heavy-duty cranes which can also be equipped with dragline or clamshell front ends.

Whatever your job requirement, there is a Marion machine of the right size and type for greatest efficiency

MACHINE	SHOVEL CAP. IN CU. YDS.	HOE CAP. IN CU. YDS.	CRANE RATINGS CRAWLER MOUNT MAX.* STABILITY	CRANE RATINGS CRAWLER MOUNT MAX. USABLE	CRANE RATINGS TRUCK MOUNT MAX. USABLE	ASK FOR BULLETIN NO.
MARION 35-M	¾	¾	18T @ 10′	18T @ 10′	25T @ 10′	431
MARION 43-M	1	1-1¼	27T @ 10′	20T @ 12′	35T @ 15′	430
MARION 362	1½	1½-2	43T @ 12′	30T @ 15′		398-D
MARION 87-M	Special Crane		150T @ 12′	75T @ 15′		—
MARION 93-M	2½	—	80T @ 12′	50T @ 15′		397-F
MARION 101-M	3	—	84T @ 12′	57T @ 15′		417-A
MARION 111-M	4	—	169T @ 12′	105T @ 15′		402-C

*For Comparison Purposes Only

MARION POWER SHOVEL CO.
Marion, Ohio, U. S. A.

Please send me

Bulletin No. 433 on the Marion 35-M Truck Crane ☐
Bulletin No. 432 on the Marion 43-M Truck Crane ☐

Name ..... Title .....

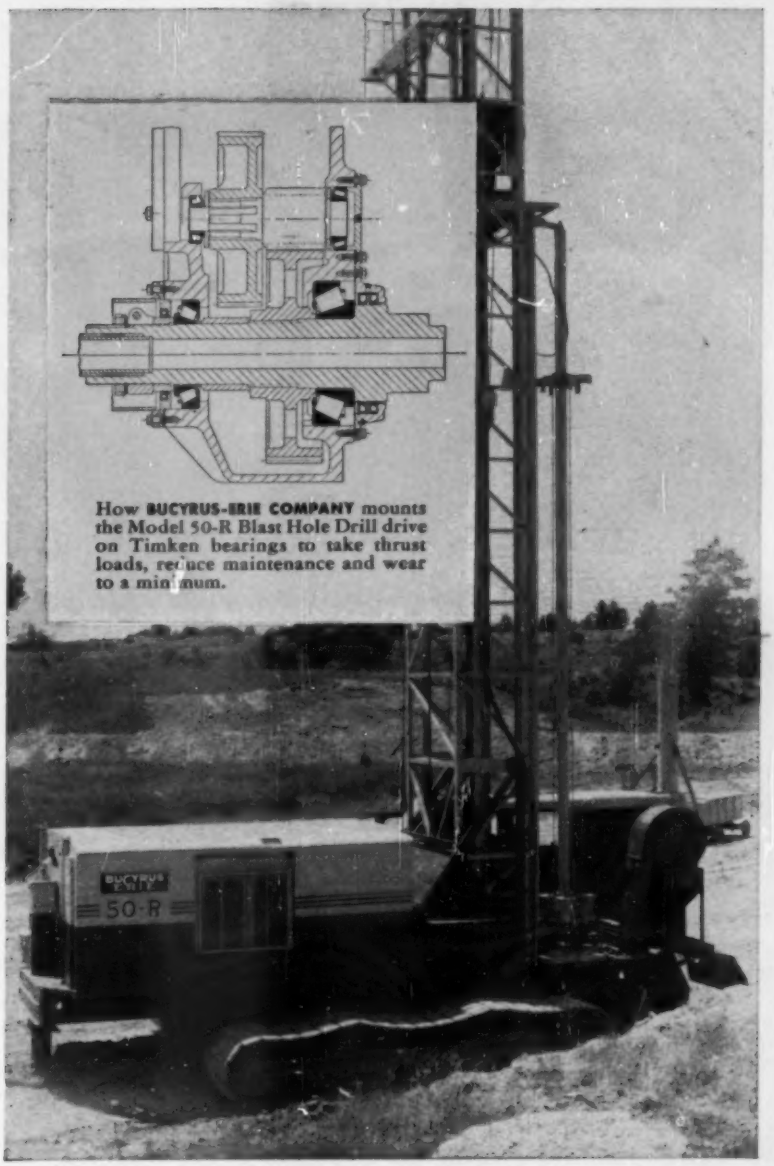
Company .....

Address .....

City ..... State .....

(129)

TIMKEN® bearings help massive rotary drill take big blast holes in stride



How **BUCYRUS-ERIE COMPANY** mounts the Model 50-R Blast Hole Drill drive on Timken bearings to take thrust loads, reduce maintenance and wear to a minimum.

DEVELOPED to meet demands for a big hole rotary blast hole drill, this Bucyrus-Erie 50-R can drill up to 12¼-inch holes with a speed never before possible. To take the terrific thrust loads on the drill bit (up to 30 tons) while drilling hardest quarry formations, and also to maintain accurate gear mesh, Bucyrus-Erie Company mounts the main and intermediate shafts of the rotary drive on Timken® tapered roller bearings.

Taking heavy thrust loads is routine for Timken bearings. That's because: 1) The tapered construction enables Timken bearings to take *both* radial and thrust loads in any combination, and 2) Full line contact between rollers and races gives Timken bearings extra load-carrying capacity.

Results show up in many cost-saving ways. With Timken bearings shafts are held in rigid alignment. Gear mesh is smooth and accurate. Shaft wear is eliminated, gear wear reduced. Parts last longer and operate steadily at peak efficiency.

What's more, Timken bearing rollers and races are case-carburized to give them hard, wear-resistant surfaces over tough, shock-resistant cores.

Only Timken bearings give you so many advantages. We even make our own fine alloy bearing steel. We're America's only bearing manufacturer that does. For the most long-lasting, money-saving performance, specify Timken bearings for the machines you buy or build. Look for the trademark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

SEE YOU AT THE

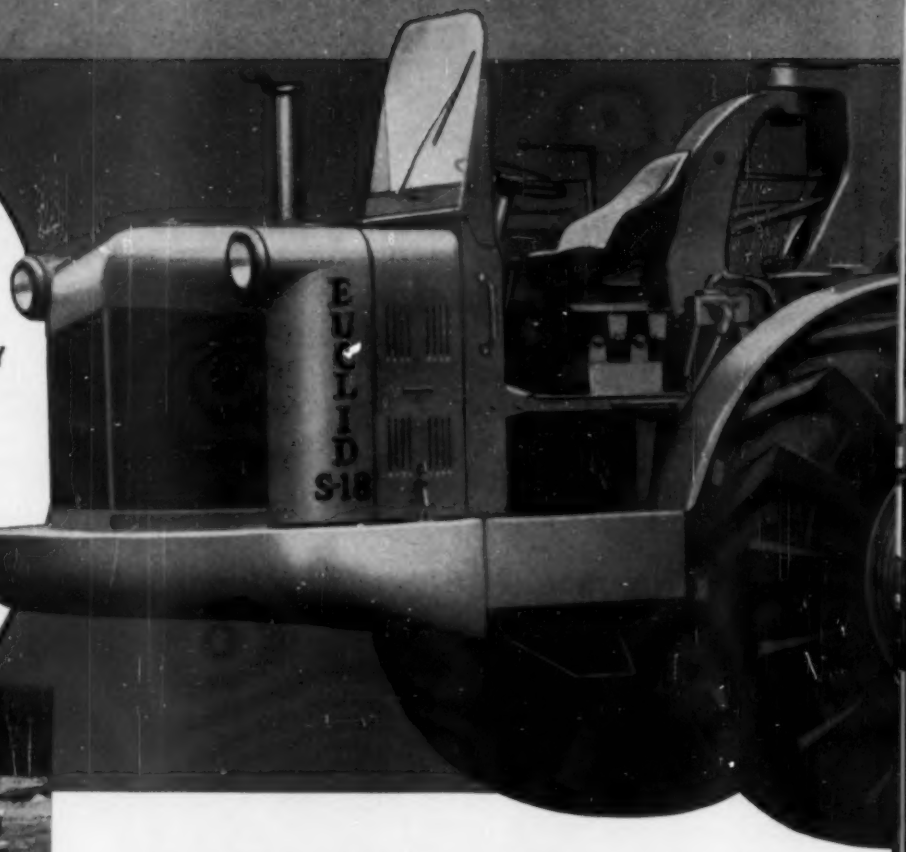
American Road Builders' Association Road Show

Space 816 Donovan Hall, Second Floor
International Amphitheatre, Chicago
JANUARY 28 TO FEBRUARY 2, 1957

TIMKEN *TAPERED ROLLER BEARINGS ROLL THE LOAD*

TRADE-MARK REG. U. S. PAT. OFF.

NOW...even more performance with



THESE THREE NEW FEATURES PROVIDE MORE WORK-ABILITY THAN ANY OTHER SINGLE ENGINE SCRAPER OF THE SAME CAPACITY

1. **New Model 6-110 300 h.p. engine of improved design with Roots Blower**
2. **Now with 4-speed Torqmatic Drive**
3. **Better power-to-weight ratio**

Improved full hydraulic steering gives the S-18 still better maneuverability and ease of handling. In spite of its size, this scraper makes a non-stop turn in only 36'. Hydraulic lever action of bowl, apron and ejector eliminates down time caused by cable breakage.

Torqmatic Drive with new 4-speed semi-automatic transmission, 300 h.p. engine, big tires, NoSpin differential and low, wide bowl provide fast, easy loading in any scraper material. The 4 section cutting edge is reversible and interchangeable—it's adjustable for varying job conditions.

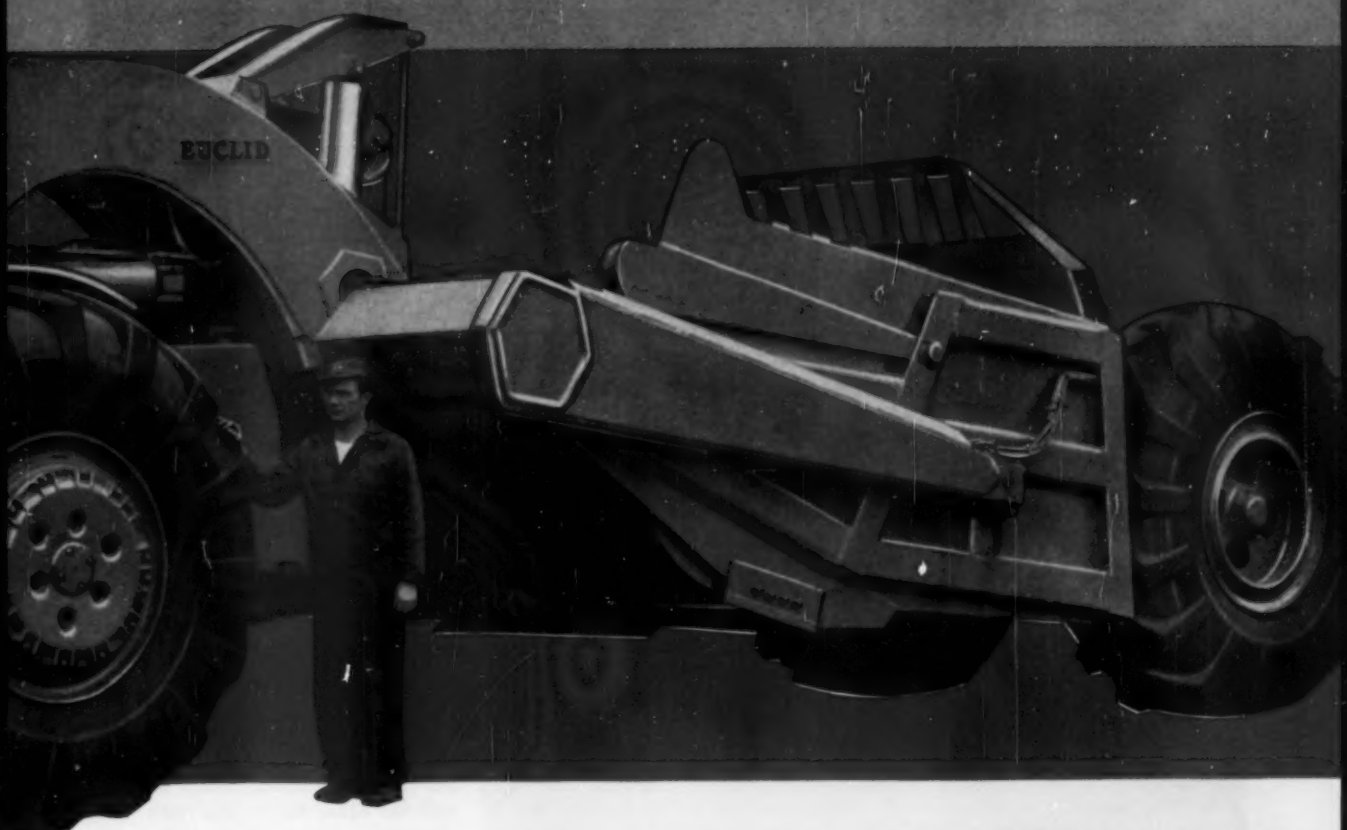
A big machine for big jobs, the Model S-18 Euclid Scraper has proved its ability to outperform comparable scrapers in productive capacity and low cost yardage. Now it has even more built-in performance with an improved power-to-weight ratio, and easier operation and accessibility than before. This new S-18 will surpass its previous high production records.

The improved 300 h.p. engine and new 4-speed Torqmatic Drive give still better performance in the lower speed ranges that are so important to efficient scraper operation. Simplified design of the engine with the Roots Blower reduces maintenance time and costs and gives more durability and fuel economy. With the 4-speed semi-automatic transmission there's a better range of speed and torque for every scraper power requirement . . . from the maximum torque needed for loading to the higher speeds used on the haul road.

Already preferred by many leading contractors because of its greater work-ability, this new S-18 incorporates many important improvements. Your Euclid dealer will be glad to explain these new features and cost-cutting advantages and show you why ***Euclids are your best investment.***

See the new S-18 at the Road Show!

the improved EUCLID S-18 SCRAPER



Faster cycle time with Torqmatic Drive—there's no clutching or loss of speed when changing from one speed range to another. Top speed with heaped loads up to 25 yds. is over 20 mph. Short overhang of the engine gives good stability for rough going and long, high speed hauls.

★ ★ ★

EUCLID DIVISION
GENERAL MOTORS CORPORATION
Cleveland 17, Ohio

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

Excavating Engineer
founded 1905 JANUARY, 1957

A battery of Ingersoll-Rand wagon drills cuts through rock on Savin's Keeler Brook cut, while a shovel loads a Euclid dump.

Turnpike Serves Population Areas

CONNECTICUT'S 129-mile turnpike, now under construction, will in some respects be unique among toll roads. Unlike most existing turnpikes which traverse open countryside, the Connecticut Turnpike will pass in many instances through large cities and extensively built-up areas. As it works its way up the coastline from the New York state line, the turnpike will pass through New Haven (population 164,443), Bridgeport (158,709) and Stamford (74,293), among other cities.

Connecticut has no turnpike commission. Under provisions of a legislative act of 1953, the turnpike is being constructed by the Connecticut State Highway Dept. The turnpike will be financed by bonds payable from turnpike revenues. Total cost of the turnpike will be about $450 million.

Not all turnpike users will pay tolls. Many regular travelers between toll stations will go free. Entrance and exit ramps will be at more than 100 locations. Tolls, which Connecticut says will be equal to or less than those charged, on a per-mile basis, on comparable sections of toll roads in other states, will be collected at eight toll stations.

Because much of the traffic will go free, operating and maintenance costs

Connecticut's 129-mile toll road will pass through New Haven, Bridgeport, Stamford.

With a large rock in its 3-yd. dipper, the shovel begins its swing toward the dump. This shovel is equipped with a General Motors diesel and a torque converter.

of the turnpike will be borne by the State Highway Fund. The State Highway Dept. will maintain the road.

The turnpike will have as many as eight lanes in heavily-traveled sections to as few as two lanes in two sections in the eastern part of the state. Provision has been made to add lanes to the two-lane sections when the need arises.

The turnpike will traverse 28 towns and cities. With the exception of two eight-lane sections in Norwalk and Bridgeport, the 49-mile section of the road between the New York line (Byram) and New Haven will be six lanes divided. From New Haven east to the Rhode Island border, the highway will be four-lane divided, except for two-lane sections between Flanders Corners in East Lyme and Connecticut Route 32 in Montville and between Connecticut Route 2 in Norwich and the state line.

With several exceptions, the turnpike will be on a new location. The recently completed Darien Expressway will be incorporated into the route. Parts of completed sections of U. S. Route 1—the Grannis Corner section in New Haven and East Haven and between Old Saybrook and Flanders—will become part of the turnpike. The present Raymond E. Baldwin Bridge will carry the turnpike over the Connecticut River.

Lane widths will be 12 feet. Paved 10-ft. wide outside shoulders will be provided. Curves generally will not exceed 3° and grades will be 3% and less. A typical median will be 26 feet wide and depressed.

Heavy-Duty Pavement

Pavement from the New York state line to the Branford Connector in the town of Branford will be a 9 to 10-in layer of reinforced concrete. East from the Branford Connector, the pavement will be bituminous concrete (1¼-in. hot asphalt surface placed atop a 2-in. binder course), except for contracts already in force or where existing two-lane concrete highways are to be converted into four-lane divided highways. In those cases, reinforced concrete will be used.

Included in the turnpike system will be 283 bridges and viaducts. Among them will be nine high-level bridges, including the existing Baldwin Bridge over the Connecticut River. The other high-level spans will be over the Byram, Mianus, Norwalk, Saugatuck, Pequonnock, Yellow Mill, Housatonic and Quinnipiac rivers. Another 198 bridges and viaducts will carry the turnpike over railroads, streets, rivers and highways. Other facilities will be carried over the turnpike by 76 bridges and viaducts.

Structures will account for 55% of the construction costs for the section of the turnpike between Greenwich and New Haven. Five structures in the part of the turnpike west of the Connecticut River will be 2,000 feet or more in length. The longest will be the Quinnipiac River Bridge, a 26-span structure with a total length of 3,773.8 feet. The Housatonic River Bridge (34 spans) will be 3,195.5 feet long. Other structures include: Mianus River Bridge, 2,660.11 feet; viaduct over New Haven Railroad and South Avenue, Bridgeport, 2,133.8 feet; and Bridgeport Harbor Bridge, 2,490.4 feet with a 65-ft. clearance above mean high water.

Landscaping is an important consideration. Asthetic design has been merged with functional design. Planting in areas where the turnpike passes through residential and congested districts will reduce noise. Planting in the median strip will prevent headlight glare. Illumination will be provided on long bridges, viaducts and most ramps in the section between Greenwich and New Haven and also at interchanges and concession areas.

Connecticut already has one of the nation's most beautifully landscaped highways—the four-lane divided Merritt and Wilbur Cross parkway system, which carries traffic at 55 mph from the New York state line to Hartford.

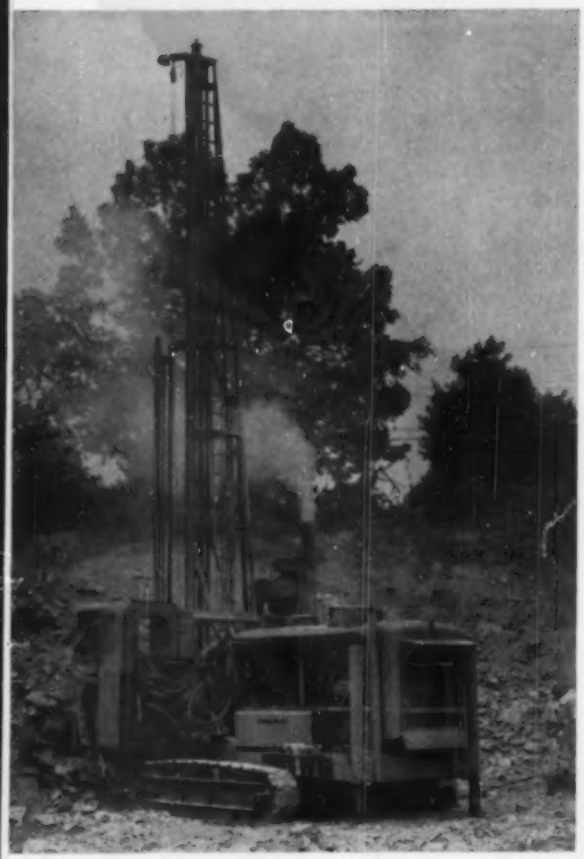
Collect Tolls at Eight Points

Proposed turnpike toll stations will be located in Greenwich, at the Norwalk-Westport town line, and in Stratford, West Haven, Branford, Madison, Montville and Plainfield. Eight restaurants and snack bars will be located along the route.

Target date for completion of the turnpike is Dec. 31, 1957. There are 42 projects in the 79 miles west of the Connecticut River. The 48.8 miles east of the river will be covered by six projects.

Building a turnpike over a congested route such as Connecticut's presents imposing problems and obstacles. Among

Two other machines on the Savin job include a dragshovel (top), used by a pipe drainage subcontractor, and another 3-yd. shovel (below), in the Keeler Brook Cut.



(Left) Savin's Ingersoll-Rand Quarrymaster drills 6-in. holes to a depth of 30 feet. (Above) Tracked drills work near railway tracks.

the difficulties is the obtaining of a right-of-way and the consequent difficulties of moving or destroying buildings located in the path. Right-of-way costs, especially through large cities, are dear.

Another problem is maintaining traffic flow through the construction area. Detours are plentiful; often, however, regular traffic is maintained through the work areas at a slower, and bumpy, pace. "Road legally closed, drive at your own risk" signs are common; in fact, it seems that nearly every road in the turnpike construction area is so marked.

Connecticut decided that it would be practical to construct its turnpike through cities and congested areas. Even with the Merritt and Wilbur Cross parkways, which skirt to the north of Stamford, Bridgeport and New Haven before turning sharply toward Hartford, traffic along the coast line is extremely heavy. This is especially true of the old Boston Post Road—U. S. Route 1. The turnpike, Connecticut officials believe, will relieve this congestion and speed vehicles on their way to Massachusetts and other New England states.

To illustrate the amount of traffic on the Connecticut coast from the New York line to East Haven, it is estimated that the average daily load in 1957 will range from 30,000 vehicles in some sections to as high as 78,000 in others. East of East Haven, the highest daily anticipated load is 17,000 vehicles.

Geology is another headache. A wide range of materials, from muck through trap rock, is found along the route of the turnpike. Out-croppings of ledge are common. Rock seams are irregular, much to the irritation of engineers, drillers and explosives men. Bridgeport harbor has yielded between 3 and 4 million yards of sand for fill.

Blast in Built-Up Areas

Blasting in highly-developed areas is tricky. Often it is necessary to make hauls of material over crowded public streets and highways.

But, despite the difficulties, contractors are making steady construction progress. Most of the work to date has been concentrated in the section west of the Connecticut River. *Excavating Engineer* visited the project last July.

A good illustration of building a turnpike through a congested area is

Two of the four 2½-yd. shovels used on the Slattery Construction project are shown at work on turnpike's western end.

offered by the Savin Construction Co., East Hartford, Conn., Savin, a subsidiary of Merritt, Chapman & Scott Corp., New York, holds two turnpike contracts with a combined value of nearly $11 million.

Project 306-03—for $8,100,000—involves the grading, drainage and paving of 6¼ miles from Darien to Westport. Construction of an 11-span bridge across the Saugatuck River is the largest item in the $2,675,000 contract for project 308-01. This job, which is only ¾-mile long, also includes the construction of three smaller structures, in addition to grading, drainage and access road items.

Savin's job, as do most of the other jobs on the western two-thirds of the turnpike project, never strays too far from U. S. Route 1, whose traffic has become further congested with the influx of vehicles involved in construction of the turnpike. In addition, Savin's spread must contend with the problem of two rivers that cut through his project—the Norwalk and the Saugatuck.

Savin's hauls, which average about a mile and a half, are complicated. "Traffic," one official said, "is terrible."

The Darien-Westport section of the project involves 1½ million yards of excavation, about a half million yards of it rock which dropped off a prehistoric glacier. The rock is full of seams, but it is not hard and breaks up well. The other million yards generally is of boulder till, which is not difficult to move. Some sticky material is found near the rivers.

Cuts on Savin's job average about 30 feet with one knob reaching a depth of about 50 feet.

Two large cuts are included. About 775,000 yards will be taken from Keeler Brook cut and another 420,000 yards will come from Strawberry Hill.

Average 1,800 Yards Per Shift

At the time of our visit, two 3-yd. excavators—a Bucyrus-Erie 71-B and a Marion 101-M—were positioned in the Keeler Brook cut. Both were averaging about 1,800 yards of excavation in a 10-hour shift. The 71-B is equipped with a General Motors diesel and torque converter. The 101-M has a Cummins diesel and also a torque converter. Both machines have Esco dippers.

A 2-yd. Lorain 820 shovel was taking down the Strawberry Hill cut. Culvert ditches were being dug by a rented rig, a 1¼-yd. Bay City dragshovel.

Some 1,300,000 yards of fill will be needed for the job being done by joint venturers A. J. Orlando and Edenwald. This 2½-yd. shovel loads a 20-yd. White trailer.

Savin's hauling equipment included 10 Euclid 14-ton end dumps, including five new ones equipped with power brakes and steering, automatic transmissions and torque converters; five LJ Macks (22 tons); and two A50 8-yd. Macks.

With the right-of-way finally cleared, Savin planned to bring in several additional shovels and the necessary hauling equipment to go with them. He hopes to finish grading work by July and begin the paving soon after.

Two Caterpillar D8 tractors, one International TD-24 and an Allis-Chalmers HD-20 are working up and down the road.

Savin's array of drilling equipment includes one Worthington and 10 Ingersoll-Rand wagon drills; one Gardner-Denver Air Trac; one Ingersoll-Rand Quarrymaster; and one I-R down-in-the-hole drill. The wagon drills are putting down 2¼-in. holes; the Air Trac 3½-in. holes; and the Quarrymaster and down-in-the-hole drill, 6-in. holes. Hole spacing is about 5½-ft. centers for the smaller diameter drills and 12, 14 and 16-ft. centers for the larger drills. Six Ingersoll-Rand compressors —four 600's, a 900 and a 300—supply air.

Hercules 60% gelatin powder is used on a ratio of ¾ pound of powder per yard of material brought down.

The Saugatuck River Bridge, a single-beam structure, will be 1,400 feet long. It will have 10 spans, on three land piers and six water piers. Overall width is 91.8 feet. Savin is doing the sub-struc-

Storm pipe trenches on the Orlando-Edenwald job are dug by this dragline with 4-yd. bucket. The contractors will lay 35,000 feet of storm and sanitary pipe.

(Left) A shovel excavates for an underpass in Branford. (Center) A scraper-tractor combination handles a grading job.

ture work. The Phoenix Bridge Co., Phoenixville, Pa., is providing the superstructure steel. Steel is being provided by the Harris Structural Steel Co., New York, for 12 smaller structures on the project.

Totals on project 308-01 include 35,000 yards of excavation and 350,000 yards of embankment. Most of the borrow for the embankment will come from Savin's Darien-Westport project.

Equipment assigned to the bridge includes a P&H 555A 35-ton truck crane; a 22-ton Lorain truck crane for pouring concrete and handling piles; a Lorain 820 crane; and Manitowoc and Koehring floating cranes.

Piles for structures are driven by this pile driver, owned by the Horn Construction Co., a subcontractor on the Orlando-Edenwald job in Fairfield and Bridgeport.

Two subcontractors on the Savin job are DiNunzio Bros., Paterson, N. J., and Edward Bray Co., Bridgeport. DiNunzio is doing the pipe drainage work—50,000 feet on the large section and 9,000 on the other. The firm is using General and Bay City dragshovels, a Lorain crane and a Caterpillar front-end loader. Bray is building 12 structures, including nine overpasses.

Savin was working one 10-hour shift six days a week. At the peak of activity, between 250 and 300 men will be employed. Mechanics and repairmen work two shifts. The repair shop is located in a prefabricated garage. For field use, Savin has two portable greasing rigs mounted on 10-wheel trucks.

Savin officials on the job include L. F. McCarthy, project manager; Charlie Hazard, office manager; and Roger Chapman, project engineer.

Slattery Job

Talk about blasting problems. Pat Kelly, the Flushing (N. Y.) Irishman who is assistant superintendent of the Slattery Construction Co. job on the turnpike, has one. Slattery's home base is Maspeth, N. Y.

Some of the cuts on Slattery's 2.6-mile job (valued at $7⅓ million) border the main line of the busy New Haven railroad. Fast passenger and freight trains zip past at two and three-minute intervals. Blasts must be scheduled be-

(Right) A large shovel loads broken rock from an excavation at Nod Road in Clinton. The turnpike will open Dec. 31, 1957.

tween trains with extreme caution so that no stray rock is cast on the railroad right-of-way.

Slattery's project, westernmost on the turnpike, extends from River Avenue, Byram, to Steamboat Road, Greenwich. Totals include 850,000 yards of rock, ranging from dead rock to trap rock; and 450,000 yards of earth excavation.

Rock cuts vary from 2 to 54 feet, including many of about 25 feet. Seams are tricky, with much side cutting demanded. A quarry which supposedly supplied stone for the building of the Brooklyn Bridge is located on the right-of-way and must be filled.

Blast holes are being put down by two Gardner-Denver wagon drills, five Gardner-Denver Air Tracs, four Chicago Pneumatic Air Tracs and also a jumbo machine, with two G-D drifters. Jackhammers are used for secondary breakage. Air is supplied by 11 compressors (Ingersoll-Rand, Jaeger and Chicago Pneumatic). DuPont powder, on the ratio of ¾ and ⅞ pound per yard of material brought down, is being employed.

Four Northwest 80-D's, with 2½-yd. dippers, are taking the excavation at an average of 4,800 yards per day. Five new 24-yd. Model B LeTourneau-Westinghouse Rockers and five 15-yd. Euclid end dumps are working under the shovels. Hauls are short.

Slattery's other equipment includes an 80-D crane, three Lorain truck cranes; six Caterpillar D8 tractors and one D9; a Cat shovel dozer; a Cat No. 12 motor grader; and sheepsfoot rollers.

Slattery is building eight bridges, including seven overpasses. The contract also includes 250-ft. long box culverts, one 7 x 7 and the other 20 x 22½, both with open wing walls, to take water from Horse Neck Lane Brook and dump it into a bay.

Work Six-Day Week

Kelly was working his spread six days a week. Hauling units and laborers work nine hours daily and eight hours on Saturday; drillers are active 10 hours a day and eight hours on Saturday. Maintenance is accomplished during two shifts. The 40 x 60-ft. shop is of prefabricated metal. At the peak, Kelly will have about 150 men on the job.

James M. Slattery is president of the Slattery Construction Co. George Benisch, Slattery vice president and traveling superintendent, is job co-ordinator. Frank Kelly is assistant superintendent. Len Peterson and G. Schaefer are project engineers; Dan Margoles is office manager; Murray Golub, office engineer; and

Continued on page 65

A Cat D8 dozer strips loam in the Orlando-Edenwald borrow area, an 80-acre site located five miles from the job site, on a hillside overlooking the Merritt Parkway.

Delivery by Rocket

H-5 Hydrocrane lifts air conditioning unit from Rocket Transfer truck to store roof. Truck-mounted crane easily follows hauling unit through crowded downtown streets.

Minneapolis truck-transfer outfit has reputation for fast, efficient hauling. Runs own fleet of rubber-mounted cranes to speed customer service and handle digging and lifting jobs.

WHEN something has to be moved fast in Minneapolis-St. Paul, the Twin Cities have a top-notch organization to call upon for service. This organization operates under the twin corporate names of Rocket Transfer Co. and Rocket Crane Service.

The transfer end of the business does local and interstate hauling of goods. The crane service end takes care of a wide variety of lifting and excavating jobs throughout the state of Minnesota.

The term "rocket" fits in well with the character of both phases of the organization. Speed is an important factor in any delivery effort, and Rocket is ideally set up in the way of experienced personnel and proper equipment to put speed into customer service. As a result, large industrial shippers of goods, materials supply houses, government units, construction firms, and many small businesses in the area have given Rocket an increasingly large share of local jobs requiring truck-trailer or crane equipment.

Rocket owes its success as a business venture in large part to its founder, Perry B. Hanson. The transfer business began 11 years ago when Perry bought a truck which he drove himself. He soon acquired three tractors, five trailers and seven straight jobs.

Today the fleet includes more than 100 tractors and trailers. Rocket is one of the Twin Cities' largest and best-known independent transfer outfits. When business is running average, the firm dispatches 30 or more trailers per day.

The firm took hold in Minneapolis because Perry had the spark of salesmanship to line up new customers, make them his friends, and hang on to their good will. He had only one thing to sell—service. Since costs of transporting goods are based on both mileage and time, the outfit with the ability to deliver goods fastest gets it there cheapest. Perry worked hard to give customers every break and job orders built up.

Business Volume Grows

Expanding business forced the firm to move twice to larger quarters. In 1945, it was located at 2100 2nd St. N.; in 1948, it moved to 1001 Marshall St. N.E. It now occupies a large 12,200 square foot concrete block structure at 51 Lowry N. on Minneapolis' industrial north side.

After bringing the firm to full stature as a highly respected service organization, Perry suddenly died of a heart attack in the fall of 1954. His widow, Mrs. Celia Hanson, determined to carry on the business on the same basis of customer satisfaction that had been her husband's trademark. Mrs. Hanson took over the duties of president and secretary of Rocket Transfer and Rocket Crane Service. The lineup of officers now includes Roy Kaliher, vice president of Rocket Crane; Mrs. B. M. Thomas, Perry's daughter, treasurer of Rocket Crane and vice president and treasurer of Rocket Transfer; and Howard Broderius, manager of Rocket Transfer.

Roy Kaliher fills the key post of dispatcher for the two Rocket branches. "Both ends of the business work hand in hand," Roy emphasized. He pays close attention to the selection of the right piece of equipment for each job and the scheduling of deliveries in order to keep rental and time charges to a minimum. Roy is an "old hand" in the transfer business; he has worked as a driver or dispatcher since 1927. He handles the job of taking telephone orders that pour in by the dozens daily

and the job of assigning drivers to each job with an air of ease and assurance that indicates experience.

Specialized heavy hauling is an important part of Rocket's transfer business. This is a service offered to shippers of equipment or materials which because of their size, weight or shape present a difficult loading and transportation problem. The job may involve moving the object across town, across the state, or across the country.

Serves Construction Industry

Industrial growth and booming construction in the Twin Cities provide a big volume of freight movement. Rocket's share of this activity includes moving heavy industrial machinery, steel tanks and pipes, structural steel, precast and prestressed concrete products, and many other classifications of items required by manufacturers and contractors. Much of the earthmoving and power shovel equipment in the Twin Cities area is also moved by the firm.

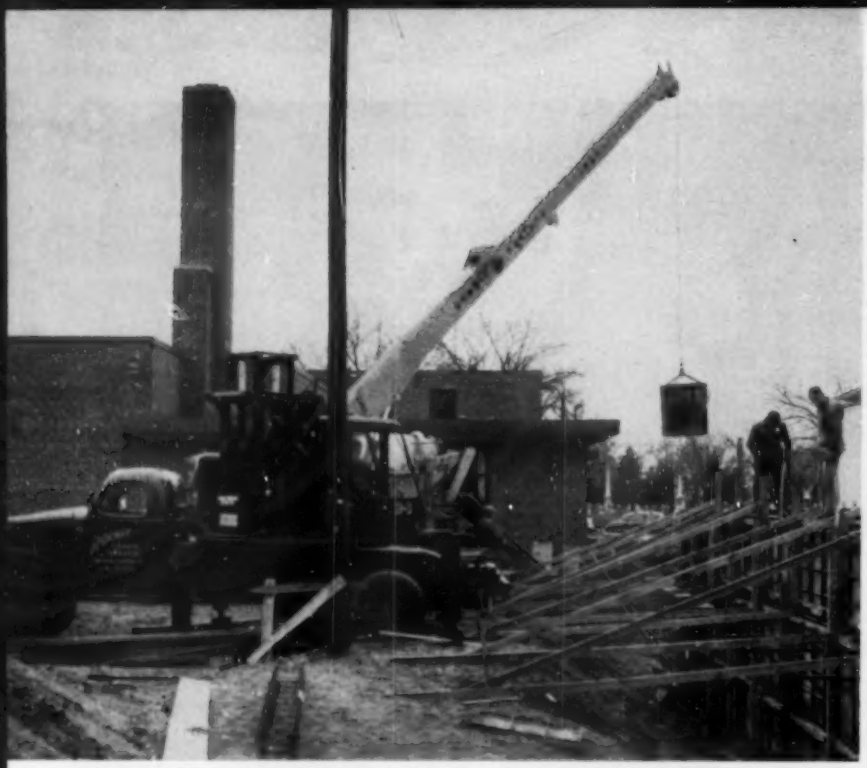
Rocket also does steady contract hauling. For instance, it has a contract with the local distributor warehouse of Armco Steel Corp. for delivery of drainage and culvert pipe to highway projects in Minnesota. A LaCrosse low-boy trailer specially built for Rocket is used to transport corrugated steel pipe sections.

Nerve center of operations is the dispatcher's desk where Roy Kaliher, vice president of Rocket Crane Service, and Mrs. Celia Hanson, president, discuss a new job order.

The firm's trailer fleet is composed of a "one from every breed," according to Kaliher. There are Fruehauf, Dorsey, Edwards, American and LaCrosse models among the 57 trailers Rocket owns.

Five low-bed 24-ton LaCrosse trailers

Crane positions a 9-ton press on a LaCrosse low-drag trailer. The tandem-axle job is hauled by an International L-195 tractor.



Equipped with ½-yd. concrete bucket, the H-5 pours wall for Minneapolis school. Hydraulically-controlled crane boom moves smoothly under electric power lines.

carry most of the out-size loads. Special units include four LaCrosse West Coast tandem trailers, 33 feet 8 inches long, with sliding tandems in the rear.

On the other hand, all but six of the trucks and tractors the firm has are Internationals. They include models from L-160 to LF-195.

In the Rocket Crane Service lineup are a Bucyrus-Erie H-5 Hydrocrane, which is an all-hydraulically operated truck crane; a smaller H-3 Hydrocrane; and a 15-B Transit Crane which is mounted on a White motor carrier. The H-5 and H-3 Hydrocranes have 9 and 4-ton lifting capacities, respectively and are equipped with ½ and ⅜-yd. clam buckets. The Transit Crane has a lifting capacity of 15 tons and handles a ¾-yd. Wellman clam.

Key piece of equipment in the movement of most goods is the Hydrocrane. Because it is mounted on an International K-8 6x6 tandem axle truck, the crane can be sent out to distant jobs as easily as any truck can be dispatched. Its light weight permits it to move around and work on soft ground on jobs which would be inaccessible to heavy conventional cranes.

Prior to purchase of the first Hydrocrane and formation of the crane service subsidiary in 1952, Rocket was a transfer outfit exclusively. If any heavy lifting had to be done, rental cranes were hired. Now that Rocket dispatches its own cranes to follow or meet its trucks, deliveries can be scheduled farther in advance and job time reduced.

When the three cranes are not loading or unloading freight, they are assigned to construction and equipment installation jobs. Most of this business is local although the Hydrocranes have been sent out as far as South Dakota and the Transit Crane north to Brainerd, Minn.

Install Fuel Tanks

Rocket established something of a record for speed and distance in setting upright fuel storage tanks at filling stations as part of a contract last summer with Phillips Petroleum Co., Minneapolis. A total of 14 tanks 11 feet in diameter and 24 feet long were installed in 14 widely separated Minnesota cities during a five-day period.

Each installation job consisted of hauling in a 5-ton 12,000-gallon tank by Rocket Transfer truck; leveling off the footing; and setting the tank in position and lining up the fittings for connection. Average job time took one hour.

Distance covered on the tank-setting itinerary was close to 800 miles. Here are the stops and mileage between each: Minneapolis, starting point; Hastings, 31 miles; Red Wing, 27 miles; St. James,

Here is a small part of the Rocket Transfer Co. equipment lineup. Entire fleet includes 46 trucks and tractors and 57 trailers.

Transit Crane unloads 12,000-gal. fuel oil tank weighing 5½ tons from flat-bed trailer on site of school in St. Louis Park.

135 miles; Windom, 27 miles; Jackson, 23 miles; Slayton, 60 miles; Pipestone, 28 miles; Willmar, 117 miles; Fergus Falls, 110 miles; Wadena, 55 miles; Brainerd, 47 miles; Aitkin, 30 miles; and the final point, Anoka, 106 miles.

Total traveling time for the H-5 truck crane was 45 hours. Roy Kaliher estimated that a conventional crane would have taken at least 10 days to finish the work the Hydrocrane handled in five.

A typical industrial moving job was

Continued on page 64

After the tank is lowered and openings are lined up, the crane backfills the excavation with a ¾-yd. Wellman clamshell bucket. Total job time was about three hours.

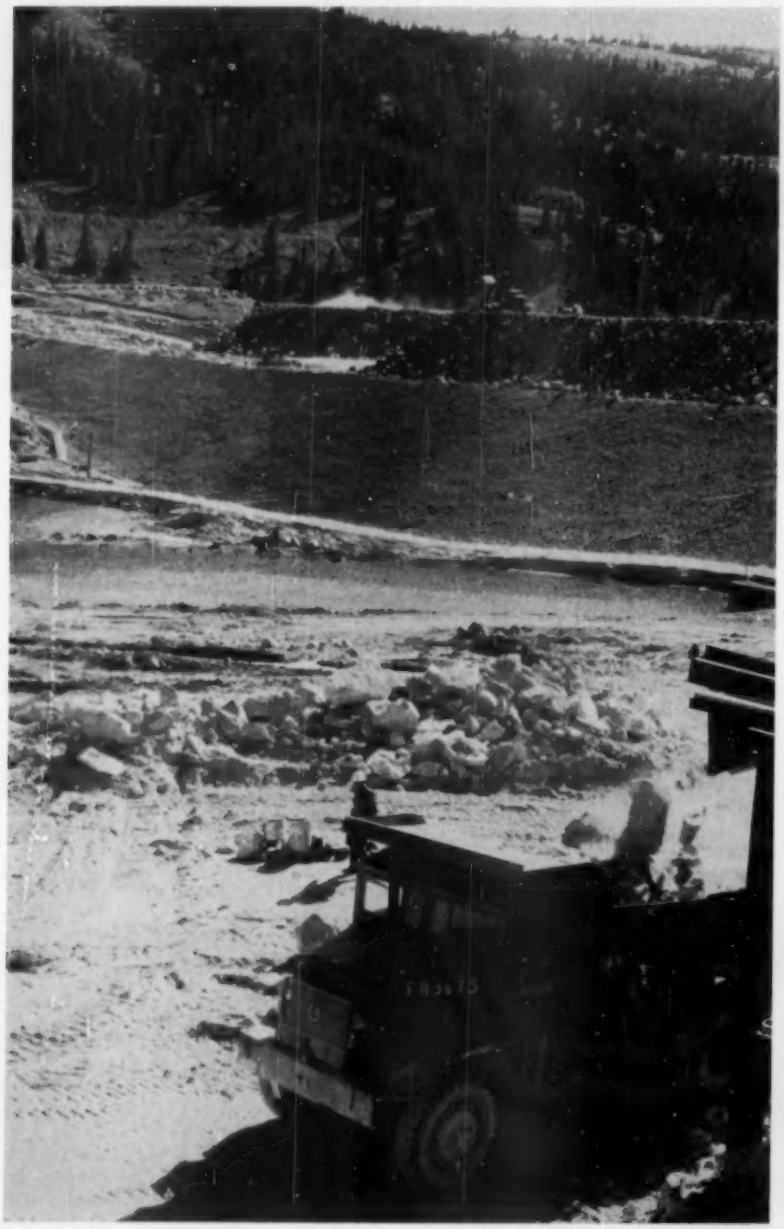
Rock Dam in the Rockies

Fisher Contracting Co. encountered hard rock, ground water, a short working season and a two-mile high altitude in constructing an 800,000-yd. rock dam structure near Fairplay, Colo.

by Ray Day

HARD rock, ground water, an abnormally short working season and a project altitude over two miles above sea level were just a few of the problems which Fisher Contracting Co., Phoenix, Ariz., handled for two years near Fairplay, Colo. The addition of the fact that available granite rock deposits were dirty, so that over half of the rock fill in an 800,000-cu. yd. structure had to be cleaned, gives some idea of the difficulty in building Montgomery Dam, on the middle fork of the South Platte River. The dam is located in some of the most spectacularly beautiful country in the Rocky Mountains.

Purpose of the big rock-fill barrier is to trap a reservoir of 5,475 acre-feet in the high mountains so that the water can be used to meet mushrooming demands in the city of Colorado Springs. Construction of the Air Force Academy, along with a general enlargement



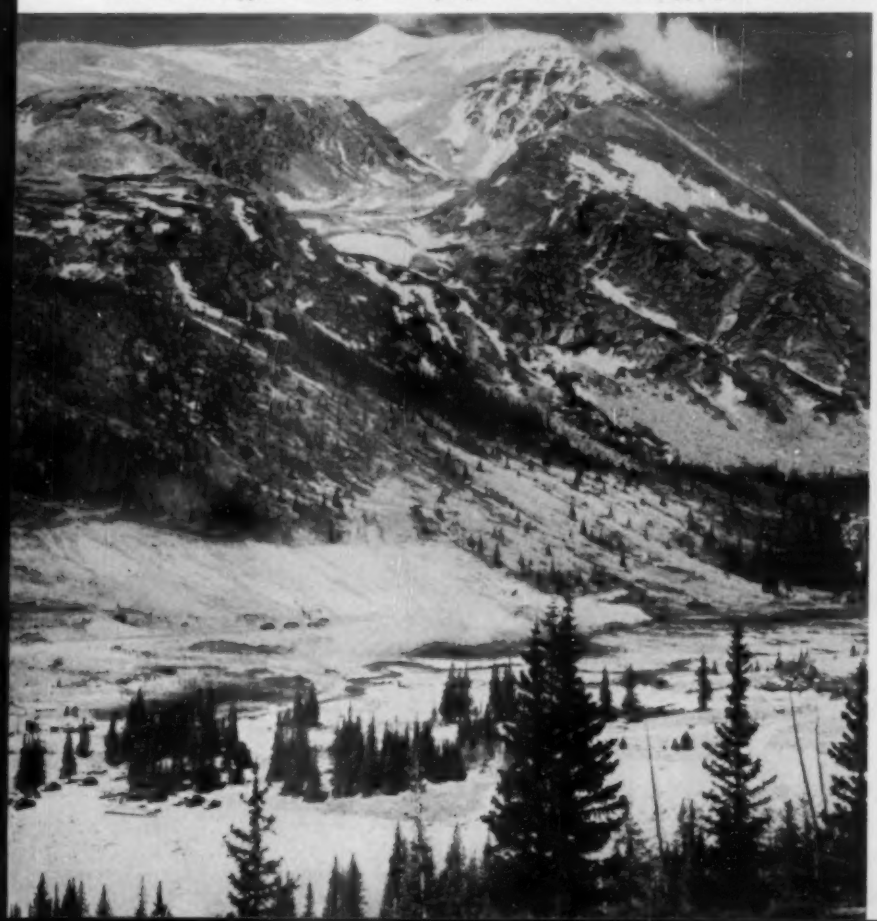
Montgomery Dam, high in the Rocky Mountains, rises in the background. In the foreground, rock for the structure is loaded into a dump from the Universal wobbler.

A 5-yd. electric shovel (front) and two 2½-yd. machines (background) supply fill for the dam. Darts and Euclids haul rock.

of residential and industrial construction, made it necessary for Colorado Springs to begin building an auxiliary water supply.

Fisher Contracting Co. began work on Montgomery Dam late in 1954. In the summer of 1955, a water transmission pipeline was laid by R. H. Fulton & Co. of Lubbock, Tex., between Montgomery Dam and Lake George, Colo., to connect the new and older parts of the city's system.

With 14,280-ft. Mt. Lincoln looming impressively in the background, this is the way the dam site appeared early in the project in 1954. Some stripping had been done.



Though many other rock-fill dams have been built in the United States and other parts of the world, Montgomery Dam is a unique structure in some respects. The engineering firm of Black & Veatch, Kansas City, Mo., had a number of problems to consider in designing the dam. The use of earth as dam material had to be ruled out. Intense winter precipitation at the site tends to saturate the top of the high Rockies. Dirt would have been hard to stabilize. Also to be considered was an extreme temperature differential, ranging from 95° summer days to subzero winter readings.

Rock Fill Design

Black & Veatch decided on a free-draining rock-fill barrier. A water-type diaphragm to retain the river, then, would be built in three parts: 1, four-stage grouting to a depth of 150 feet below the dam; 2, a concrete core wall keyed into bedrock and reaching an elevation visible along the toe of the dam; and 3, a 15-in. thick blanket of impervious asphalt paving to be placed in a future contract.

Montgomery Dam is 2,200 feet long. It reaches a maximum height above streambed foundation of 118 feet. Its location, 10,870 feet above sea level, is one of the highest in the United States. Maximum base width is approximately 400 feet. The dam contains approximately 800,000 cubic yards of rock-fill material.

The main bulk of the dam is called Zone 1. Specifications for rock fill for

Here is a closeup of one of the 2½-yd. shovels loading blasted rock into a Dart truck. The dam contains approximately 800,000 cubic yards of rock-fill material.

Zone 1 called for 90% of material ranging in size from four inches to five tons. A 10% tolerance was made in this material for small gravel, sand and particles of rock up to four inches in size, because of the practical difficulty of obtaining perfectly clean material. Even so, the presence of considerable dirt and sand in two available quarries at the site made it necessary to clean nearly half of Zone 1 material with a mechanical wobbler.

Zone 2 consisted of a blanket of material 10 feet thick placed on the upstream side. Specifications for Zone 2 rock called for 100% material between three inches and five tons. No fines smaller than three inches were permitted in Zone 2 material because it was necessary to develop positive free drainage. It was necessary to clean all of the Zone 2 material artificially by mechanical methods. This will be detailed later.

As a leveling course for the impervious asphalt blanket, the Zone 2 fill was being faced with an average of nine inches of ¾-in. to 3-in. material obtained in cleaning the larger rock. It was placed by dragline as part of the prime contract. Fisher's contract also included construction of a reinforced concrete spillway with a fixed crest, and inlet and outlet structures containing a 66-in. cone-type valve and a 72-in. butterfly type valve. These works will train reservoir water down through the delivery pipeline and will take care of the stream's overflow during flood periods.

Short Work Season

In setting up an organization for the $2,247,672 project, Fisher picked good men and machines. The working season was so short—May through October—that peak output for both men and machines was necessary. And it was difficult to get full efficiency out of either men or machines, primarily because of the extreme altitude. The dam was located in country which caused men, like air compressors, to wheeze for breath.

After building the necessary access roads and pioneer trails, Fisher established a central headquarters yard near the center of the downstream toe of the dam. The office and administrative headquarters were placed upstream in the reservoir area, in the clear of any expected flood stage. The first assignment was construction of the inlet and outlet works and the concrete spillway. The sooner these structures could be built, the sooner rock excavation and fill could move at peak capacity.

With a dependable supply of compressed air a "must," a centralized com-

Continued on page 41

Zone 2 rock and face material are handled by a Koehring 605 dragline. The dam is located 10,870 feet above sea level.

Road Show Highlights:

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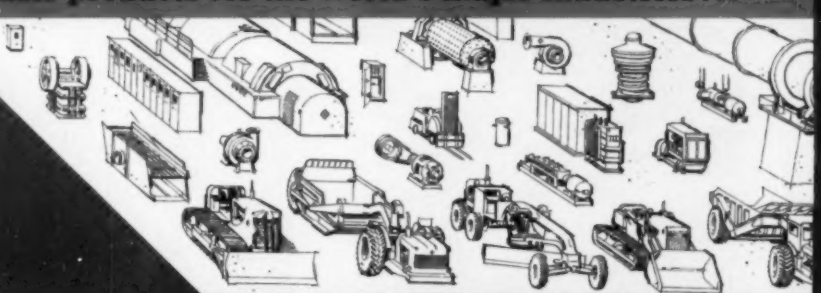
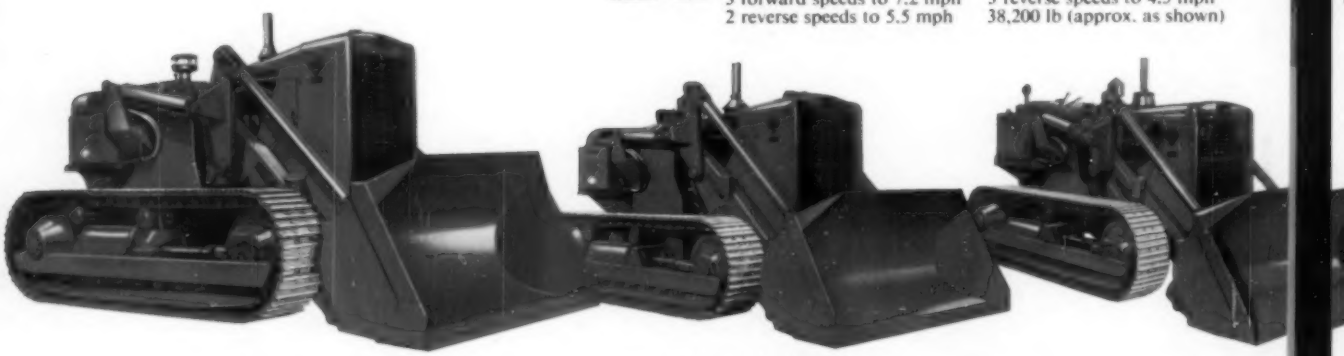


give YOU a complete line of advanced-design construction machinery... for production and profit on the job!

Engineering-in-Action FOR

HD-21 204 net engine hp (torque converter drive)
2 forward speeds to 7.5 mph
1 reverse speed to 5.5 mph
53,400 lb (approx. as shown)

HD-16 150 net engine hp (torque converter drive)
3 forward speeds to 7.2 mph
2 reverse speeds to 5.5 mph
141 belt hp (standard transmission)
6 forward speeds to 5.8 mph
3 reverse speeds to 4.5 mph
38,200 lb (approx. as shown)



4-cu-yd HD-21G 204 net engine hp (torque converter drive)
13-ft. 4-in. dump height
66,500 lb

3-cu-yd HD-16G 150 net engine hp (torque converter drive)
12-ft. 3-in. dump height
47,800 lb

2¼-cu-yd HD-11G 111 net engine hp
11-ft. 7-in. dump heigl
32,000 lb

Model 315 Struck—15 yd
Heaped—20 yd
Cable control
25,850 lb

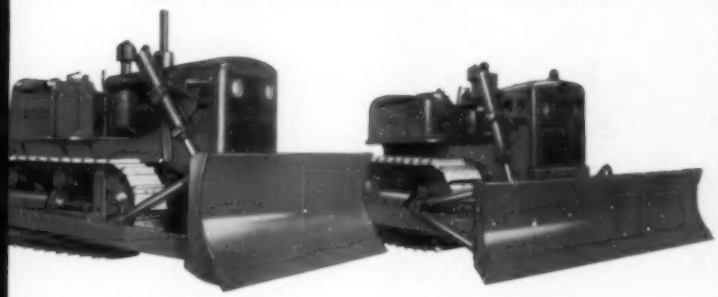
Model 108 Struck—8.4 yd
Heaped—11 yd
Cable control
15,250 lb

TS-360 280 hp
Struck—15 yd
Heaped—20 yd
Speeds—to 20.0 mph
Weight—49,050 lb (approx.)

TW-360 Struck—17 yd
Heaped—22 yd
Tons—26
Weight—47,000 lb (approx.)

TS-260 200 hp
Struck—11 yd
Heaped—14 yd
Speeds—to 20.0 mph
Weight—39,600 lb (approx.)

PRODUCTION AND PROFIT ON THE JOB



HD-11 94 belt hp
6 forward speeds to 5.7 mph
3 reverse speeds to 4.4 mph
24,600 lb (approx. as shown)

HD-6
63 belt hp
5 forward speeds to 5.5 mph
1 reverse speed to 2.0 mph
15,850 lb (approx. as shown)

1½-cu-yd HD-6G 72 net engine hp
10-ft dump height
19,600 lb

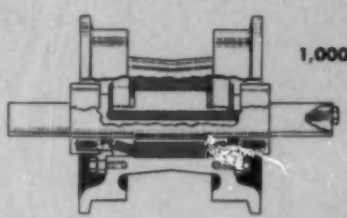
Model 106 Struck—6.1 yd
Heaped—7.5 yd
Cable control
10,300 lb

Model 44 Struck—4 yd
Heaped—4.7 yd
Hydraulic control
6,595 lb

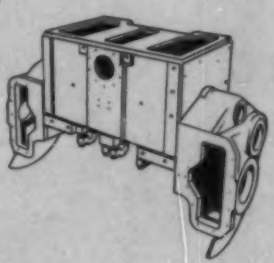
TR-260 Struck—11 yd
Heaped—15 yd
Tons—18
Weight—43,800 lb
(approx.)

Examples of Engineering in Action ADVANTAGES pioneered and proved by Allis-Chalmers

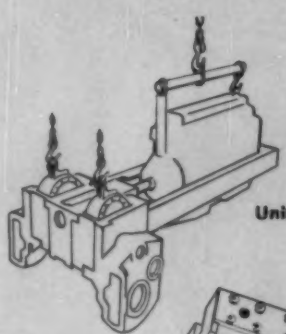
Torque converter drive



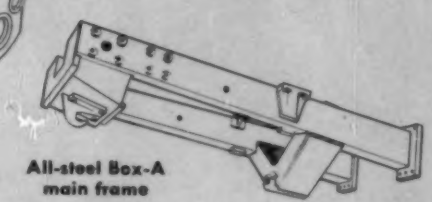
1,000-hour lubrication intervals



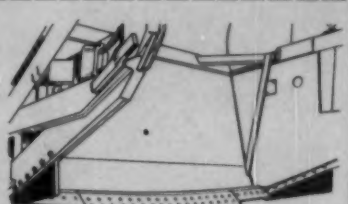
One-piece steering clutch and final drive housing



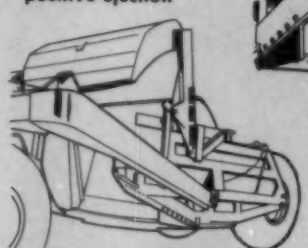
Unit construction



All-steel Box-A main frame



High apron lift and positive ejection

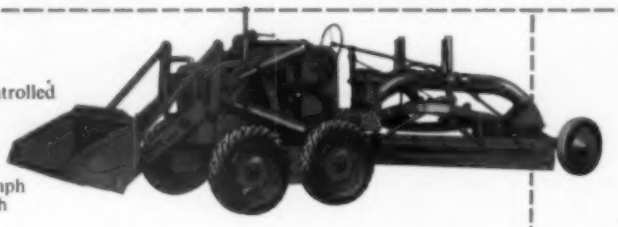


Curved bowl bottom and offset cutting edge

Engineering-in-Action

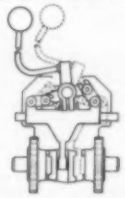
FOR PRODUCTION AND PROFIT ON THE JOB

Model D Standard and Rear-End Loader
8,800 lb (gasoline)
9,350 lb (diesel)
⅝-cu-yd bucket—hydraulically controlled
Loader—2,200 lb (approx.)



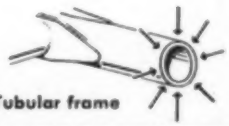
FORTY FIVE
120 brake hp
6 forward speeds to 20.6 mph
3 reverse speeds to 7.0 mph
23,800 lb (approx.)

ROLL-AWAY is an Allis-Chalmers trademark.



Toggle-type control

Roll-Away moldboard



Tubular frame

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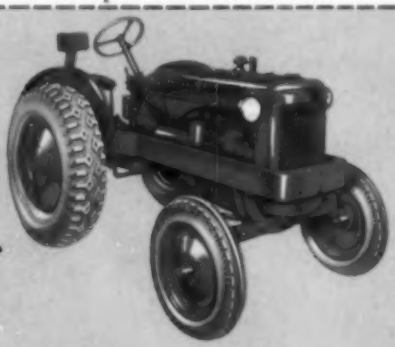
Choice of sizes from 28 to 243 max. brake hp (at 1800 rpm)
Choice of fuel

WHEEL TRACTORS

Model IB
22.87 belt hp

Model WD-45
45 belt hp



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ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

Form No. MS-1198-5612

Printed in U.S.A.

A few large rocks in the top of the dam are adjusted by a truck-mounted dragline. The final topping-out lift was five feet thick.

Montgomery Dam . . .

Continued from page 36

pressor house containing five large-size air compressors was established. These included a Gardner-Denver 500-cfm reciprocating machine, an Ingersoll-Rand 600-cfm Gyro-Flo and three Gardner-Denver 600-cfm stationary machines driven by electric motors. All five machines were hooked into a common air receiver, so that air could be delivered to all work areas in the quarry through 6-in. delivery lines.

Outside power was brought in over transmission lines. Much electric power was necessary to operate many small electric motors and also larger machines such as a Bucyrus-Erie 110-B electric shovel which was used in the quarry.

Portable Batch Plant

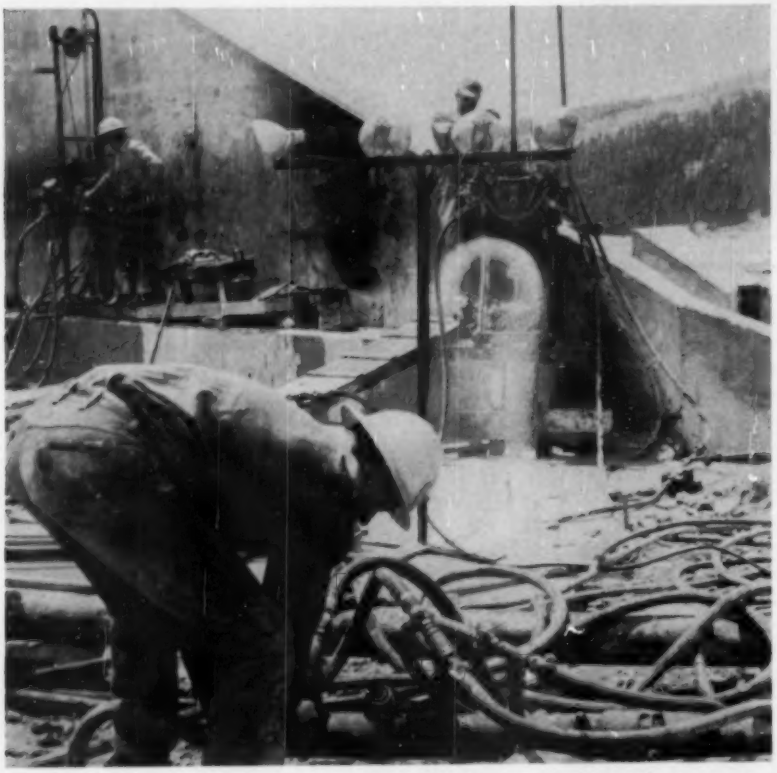
Construction of the spillway and outlet works structures followed conventional lines. They are not fancy structures. Their only requirement was high-grade concrete placed at close tolerances. Fisher set up a central carpenter yard where about 60% of the forms were prefabricated and set in place. Some Universal Uniform panels also were used where concrete sections were rectangular and typical. A special Auto-Crete portable batching plant, developed by Del Fisher of the company chiefly for fast mobile concrete work on highways, was used for proportioning the mix for the spillway and outlet structures. Two truck mixers were able to keep pace with concrete work. They took their 5-yd. loads from the portable batcher and mixed them on the way to the concrete placement site. A Link-Belt Speeder 25-ton truck crane, with a 1-yd. concrete bucket, placed the material from the truck mixers. The outlet works was finished by mid-1955. A good start was made on the rock fill that year. The spillway also was finished in 1955, allowing full-scale rock shooting and fill placement to be scheduled for the 1956 construction season.

The presence of considerable ground water in saturated cracks and fissures throughout the high granite formations made quarry drilling and shooting much more difficult than it might have been had the dam been located at a lower elevation. Dirtiness in the fissures and the presence of occasional clay streaks made drill bits stick despite the care used on all rigs.

The drilling job ahead of the power shovels was done by three Gardner-Denver Model 123 drills set on Air Trac

This intelligiant hydraulic monitor sluices the rock fill as it is constructed. Shot at 80-psi pressure, the water settles small fragments into voids between large stones.

self-propelled carriages. These machines, supplied with compressed air from the delivery pipeline, sank a hole pattern 9 x 13-ft. and 9 x 12-ft. centers. Tungsten-carbide insert drill bits were used on 10-ft. long sections of steel. The machines generally were being used to maximum depths of 35 feet. The drilled holes were bottomed at 3½-in. diameter. Each drill rig accounted for approximately 400 feet of hole per eight-hour shift. The use of the Air Trac carriage mountings greatly increased drill efficiency because of their ability to maneuver under their own power to the next hole location.



Several diamond drills employed in grout hole drilling are supplied with air and water from this type of "Christmas tree" connector. The formation was highly seamed.

Because of ground water, special gelatin-type powder was used—both Hercules and DuPont in 40% strength in 3-in. diameter cartridges. One of the chief problems for a while was to get the powder down tightly in each drill hole so that the explosive was crammed against the walls. Finally, the powder foreman decided to tamp the first eight cartridges individually, with wooden sticks, in the bottom of the hole, after splitting the side of each cartridge case. By tamping the eight cartridges tightly against the walls, a well-confined, powerful explosion was guaranteed at the bottom of the cut where it was vitally needed. After the eight lower cartridges were lowered, alternate units were tamped until a solid column of powder had been placed to within eight feet of the top of the drilling bench.

Excellent Breakage

In setting up a shot, the face row of holes was set off instantaneously by Primacord detonating fuse. Delay action was developed by using Primacord MS connectors between the rows of holes. By firing the shots the same day they were loaded and by sticking closely to the loading systems, excellent breakage was developed with a powder ratio of .86 pound per cubic yard. Use of the Primacord MS connectors between rows also tended to pile the rows one on the other, developing some secondary breakage. Only a minor amount of secondary drilling shooting was necessary. This drilling was done by several jackhammers and an Ingersoll-Rand 315-cfm compressor. Motive power for this compressor was furnished by a small LeRoi 125-cfm Tractair. The Tractair also furnished some air to the jackhammers.

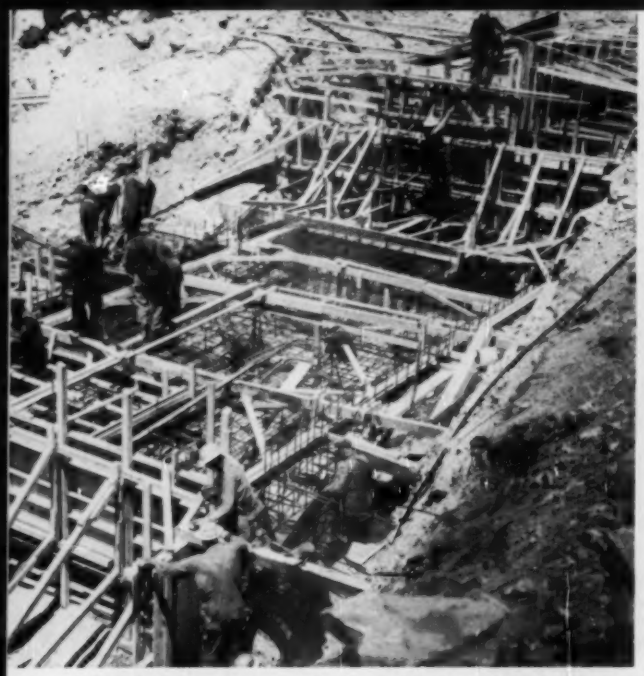
Three shovels were used principally to load all rock from the quarry. These were two Northwest 80-D's with 2½-yd. Esco dippers, and a Bucyrus-Erie 110-B with a 5-yd. dipper. Working against the high face developed by drilling and shooting, these machines supplied rock to the fill with the help of nine Euclid 9.5-yd. end-dump trucks, and four Dart 20-yd. end dumps with torque converters. The Darts were powered by Buda diesel engines; the Euclids with Cummins diesels.

Probably the most difficult problem in the operation was to load and transport clean rock which would meet Black & Veatch specifications. Loading of Zone 2 rock direct for the fill was out of the question because the specifications ruled out any particles smaller than three inches. But frequently, by careful manipulation of the power shovels, it was possible for their operators to send loads to the fill sufficiently clean to meet specifications. This sorting was done by pulling a dipper through the bank several times, and then loading from the clean fraction of rock thus separated. Dirtier material was loaded in other trucks for transportation to a cleaning unit.

Working two 10-hour shifts six days a week, the two shovels moved approximately 8,000 yards per day. Of this amount, about 60% was handled by the 110-B, the remainder by the 2½-yd. Northwests. The combination of the big and small machines worked well. The big 110-B would pick up and handle almost any size of blasted stone. An 80-D could load much of the rock and kick oversize boulders over to within reach of the 110-B. The quarry floor was cleaned periodically by a Caterpillar D8 with a cable-controlled dozer blade.

Clean Dirty Rock

The company started the 1956 season by setting less than 500 feet from the quarry a special unit designed to clean dirty particles out of loads of material which otherwise would not meet specifications. The unit consisted of a large plate feeder hopper and a mechanically powered wobbler made by Universal Engineering Co. Loads of dirty material passing over this wobbler were cleaned of all fine particles. Oversize rock meeting specifications then was dumped by gravity to a truckbed below. The fraction from three inches down was dropped to an elevating conveyor, which hoisted the material up to a set of electrically-powered Symons vibrating screens. As the material passed



(Left) Men work on concrete forms for the outlet structure. (Right) An Ingersoll-Rand compressor is serviced by the lube truck.

over the screen deck, water jets under high pressure washed all decantable dirt and other solids from the rock particles ¼ to 3 inches in size. This fraction then was taken off clean and used for the blanket course on the upstream face. The sand and dirt fraction was hauled to a waste area, where eventually it would be covered by the new reservoir. Of 8,000 yards handled each work day, approximately 1,500 yards consisted of blanket course fines and waste material.

Rock fill was placed in thick lifts. The first lift, which was placed from abutment to abutment, was 42 feet thick. After this came a second lift, 40 feet high. When *Excavating Engineer* visited the project, the 40-ft. lift was rapidly nearing completion. The third lift was to consist of a 22-ft. thick ribbon of rock stretched across the valley. This was to be followed by a fourth lift, seven feet high, and a final 5-ft. topping-out lift. Placement of all lifts was by the end-dump method. Trucks worked their way across the valley, assisted at the dumping point by a Caterpillar D8 dozer which kept the ribbon of fill material level and evenly placed. Spotters controlled the stopping point of the trucks.

In an effort to develop a highly monolithic dam structure with all rock in point-to-point contact (to minimize shrinkage and settling), two high-powered 3-in. diameter Intelligiant hydraulic sluicing monitors shot streams of water at 80-psi pressure into the fill material as equipment dumped it off the edge. To get the water, the company went two miles above the dam to a take-out point on the stream and laid a 16-in. diameter steel pipeline from that point to the monitor distribution system. Pressure in this pipeline through gravity would build up to 125 psi when the monitors were off; to 80 psi when both units were working. The high-pressure water jets sluiced all fines into the openings between larger rock.

Dewater Core Wall

What few pumps there were on the project were being used for dewatering along the concrete core wall and for transferring a part of the stream flow. Included were two small 3-in. Jaeger centrifugals, a 6-in. Marlow and an electrically-powered Fairbanks-Morse.

Zone 2 material was placed by a combination of end-dumping over the side and on the top, followed by a leveling and placing by a Koehring Model 605 dragline. The blanket course rock was end-dumped off the fill and evened up by the Link-Belt Speeder truck crane working as a dragline.

The finishing touch was the placement of pressure grout by Continental

Continued on page 68

Construction Manager Warren Hunter (left) chats with (from left) Project Supt. Ken Willis, Engineer Wally Goodwin, Office Manager Tom Bosley and Pete Wahlin.

Dredges Place Highway Fill

New 21-mile section of U. S. Route 51 is being built to replace highway that has been in use 40 years. Hydraulic fill is being used. Job also includes a 3,012-ft. high level bridge.

ACCESS to New Orleans, La., from such cities as Memphis, Tenn., and Jackson, Miss., will be made easier in about a year with completion of a new 21-mile strip of highway in Louisiana to replace a part of U. S. Route 51.

The new two-lane highway will be built adjacent to the present Route 51 and will extend from Ponchatoula south to LaPlace, where it will connect with U. S. Route 61, the main route between New Orleans and Baton Rouge.

Between Ponchatoula and LaPlace, Route 51 is a 40-year-old bumpy, uneven and narrow highway with narrow bridges. This section of the highway will be abandoned when the new highway is completed.

The new highway project will be one primarily requiring hydraulic fill obtained from a canal and an area paralleling the present road. The new roadway will cover part of the old canal which provided borrow for the existing road.

An interesting aspect of the project is construction of the 3,012-ft. long fixed-span high-level bridge at Manchac. Prestressed, precast, hollow concrete cylinder piles will support the bridge, which will span Pass Manchac, between Lake Maurepas and Lake Ponchartrain. Prime contract on the $1.5 million bridge job is held by W. R. Aldrich & Co., Baton Rouge.

Bridge Divides Project

The Manchac Bridge is the dividing point between two sections of the highway project.

To the north, for 7.8 miles to Ponchatoula, the $990,416.19 prime contract for clearing, drainage and fill is held by T. L. James & Co., Ruston, La. This contract involves 81,031 yards of common excavation; 2,700 yards of drainage excavation; 108,484 yards of muck excavation; and 1,420,397 yards of hydraulic fill.

The $2,853,894 prime contract for the southern section of the project, which extends 13.764 miles from the Manchac Bridge to LaPlace, is held in joint venture by the McWilliams Dredging Co. and Jahncke Service Co., both of New Orleans.

Totals on this contract include: muck, 836,826 cubic yards; hydraulic embankment, 3,529,535 yards; common excavation, 128,795 yards; and drainage excavation, 4,000 yards.

McWilliams-Jahncke subbed out work to the Circle Dredging Co., a subsidiary of the Monroe Wolfe Co., New Orleans; Great Lakes Dredge & Dock Co., New Orleans; W. P. Villere Co., New Orleans; Sabine Dredging Co., Port Arthur, Tex., and Kenyon Dredging Co., Port Allen, La.

Roadway contracts are to be let later. The highway will have two 12-ft. traffic lanes and 10-ft. shoulders. The wearing surface will be a hot mix or surface mixture placed on 12 inches of gravel. Concrete will be substituted for the wearing surface after the road settles in a few years.

Excavating Engineer paid a brief vis-

A 12-in. single deck suction dredge, the *Tennessee* is building a hydraulic fill containing 880,000 yards for a 3½-mile section.

it to the southern phase of the project last spring. Among rigs active on the project then were Villere's 6160 Monighan, a walking dragline with a 10-yd. bucket; Great Lakes' *Conical*, whose 240-ft. long boom revolves on a conical mast and swings a 6-yd. clamshell bucket; and three suction dredges—Circle Dredging's 12-in. *Tennessee* and Sabine's 10-in. *Gary Bernard* and 12-in. *L. C. Gibbs*.

Two more dredges were scheduled to be brought into the job—McWilliams 20-in. *Natchez* and Jahncke's 16-in. *Paul F. Jahncke*.

A veteran 6160 Monighan walking dragline with a 10-yd. bucket is another rig active on the southern end of the Route 51 project. It strips ahead of suction dredges.

Job Started in '55

Work started on the project in November, 1955 and was scheduled to be finished in 400 working days. Enough fill will be needed to create a 44-ft. wide embankment. The eastern slope of the embankment will not be steeper than 5 on 1; the western slope of the embankment will not be steeper than 5 on 1, or flatter than 24 on 1.

The distance from the center line of the new highway to the borrow area will be 500 feet. The borrow area is 150 to 250 feet wide. The area between the highway and borrow area is being used for disposal of undesirable material.

The *Tennessee*, a single-deck suction dredge built in 1944, was building a fill on a 3½-mile section that Circle Dredging had on subcontract from McWilliams-Jahncke.

To build a fill containing 880,000 cubic yards, the *Tennessee* will have to move about 1,300,000 yards from the borrow pit. The fill material includes soft clay, sand and shell. Silt is undesirable material for construction procedure, but suitable for fill if it can be retained.

In its first four days in the borrow area, the *Tennessee* traveled 400 feet. Material taken by the dredge was being pumped through 650 feet of 12-in. floating pipe mounted on catamarans and another 1,500 feet of shore pipeline. Anticipated production rate was 3,000 yards in place in the fill per day.

The *Tennessee*, whose hull is 88 x 34 x 6½ feet, is digging to minus 40 feet mean sea level. Its digging ladder is 54 feet long. It has two 65-ft. long spuds. Digging to 40 feet mean sea level, the distance from the spuds to the cutter is 138 feet.

Powered by a General Motors 8-268A 550-hp diesel engine, the dredge uses about 400 gallons of fuel per day. Electrical power is derived from a Cummins LRI engine, which drives a 150-kw General Electric generator.

The dredge carries a fuel supply of 6,000 gallons. Another 6,000 gallons are stored in two tanks on a nearby supply barge.

The dredge's manual controls are located in an elevated operating house. The dredge *Gary Bernard* mucked out the old roadway borrow pit of undesirable organic matter. Clearing the borrow pit was done by James M. Teer, Lavonia, La.

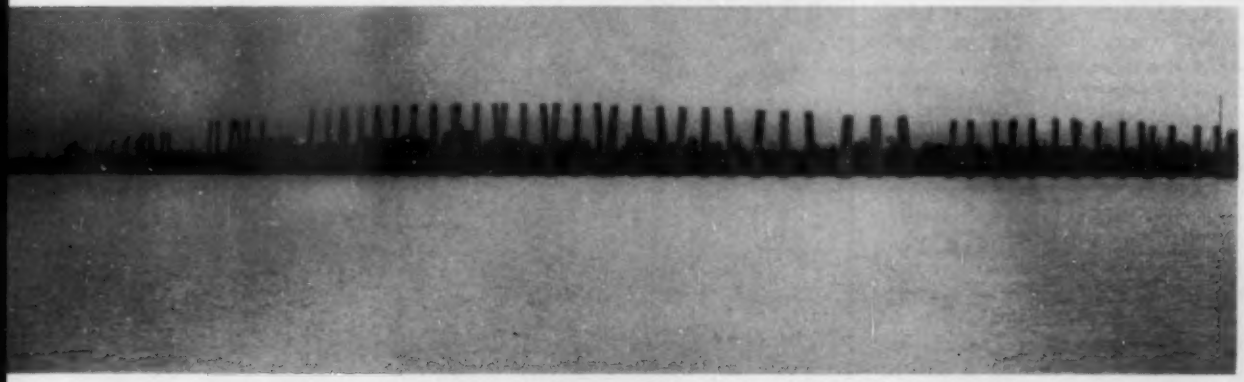
Villere's Monighan 6160, mounted on a 50 x 175 spud barge and equipped with a 10-yd. dragline bucket, strips ahead of the suction dredges. It goes down to minus 9 sea level, taking all top dirt, roots and stumps. Working three eight-hour shifts, the Monighan averages 7,500 yards of excavation every 12 hours. The Monighan is powered by a 600-hp Busch-Selzer engine.

Dredge Removes Muck

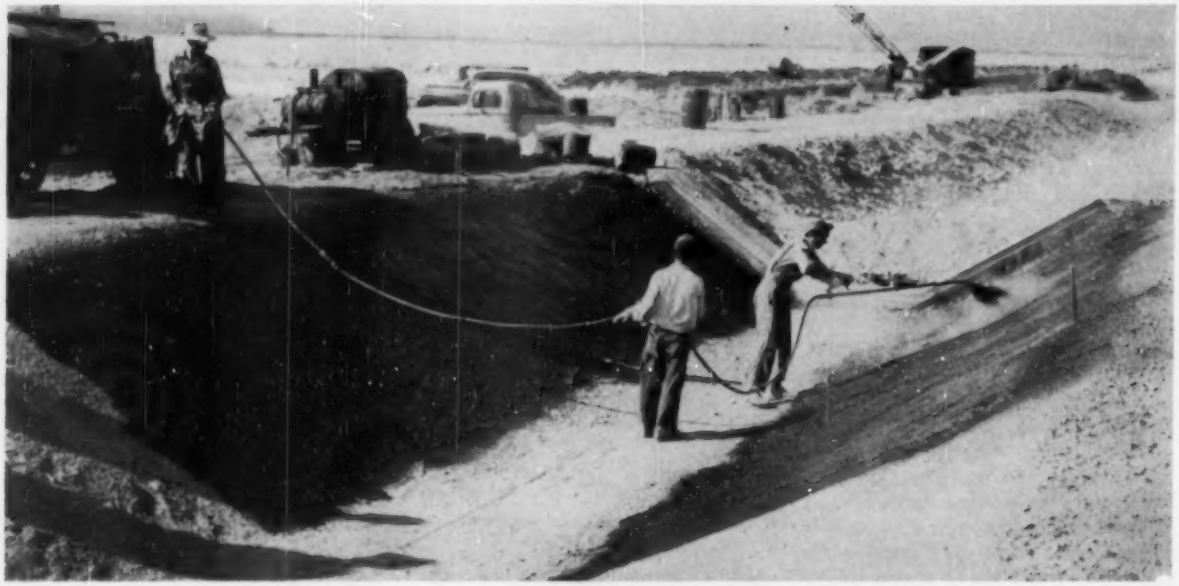
The long boom of the dredge *Conical*, which is operated from a position three stories above the deck, reaches far out into the heavy and eerie greenness of the land in a mucking-out operation. Its assignment on the sub-contract was to strip approximately 1 million yards of unsuitable material from the hydraulic borrow area and waste it.

The *Conical*, of all steel construction,

Continued on page 68



Concrete piles for the 3,012-ft. Pass Manchac Bridge jut out of the water. Bridge divides two sections of the highway job.



Workmen spray an asphalt membrane on a lateral of the Klamath irrigation project in California for Bureau of Reclamation.

News from the Field

Asphalt Canal Lining

More than 134,000 miles of canals and laterals in the United States carry 95,441,491 acre-feet of precious water annually from storage basins to point of irrigation in our 17 western states.

These systems irrigate some 24,270,566 acres of range and farmland—an area larger than the entire state of Indiana.

Seepage losses of water in transit through these canals cost these semi-arid states more than 18 million acre-feet each year. This is three times the volume of water used each year for all irrigation purposes in the state of Utah where, in 1847, modern irrigation was begun by the Mormons who diverted the waters of City Creek in Salt Lake City.

This tabulation of annual water waste, presented by George P. South of the United States Bureau of Reclamation at Salt Lake City, highlighted the First Western Conference on Asphalt in Hydraulics, held recently at the University of Utah under the co-sponsorship of the University, the Asphalt Institute and the Utah Water Users Assn.

The discussion by a panel of 19 engineers covered a wide range of asphalt uses from reservoir lining to asphalt groins for beach stabilization. Primary attention was focused on the problem of low-cost canal linings to conserve water.

Principal work in this field has been done by the Bureau of Reclamation which expanded its research facilities in 1946 to explore the use of asphalt for low-cost canal lining. Ten years later the Bureau now has 84 asphaltic structures in 15 states, 15 of these located in California and 14 in Wyoming.

Reviewing the use of asphalt construction in the West, L. M. Ellsperman of the Bureau of Reclamation at Denver told the conferees the Bureau's first

Continued on page 50

"How many times must I remind you, gentlemen? We are not accepting bids on my secretary!"

Hook up your holes for *better digging*

PRIMACORD®
DETONATING FUSE

This hole is awaiting *your* orders. It is loaded and ready to "go," but it won't "listen" to stray electric currents, or even to lightning . . . it's primed with Primacord.

When it does go, it will fire in its proper sequence because it is hooked up to a Primacord trunk line which connects all holes in a fire pattern designed to insure relief of burden — produce better fragmentation, *better digging.*

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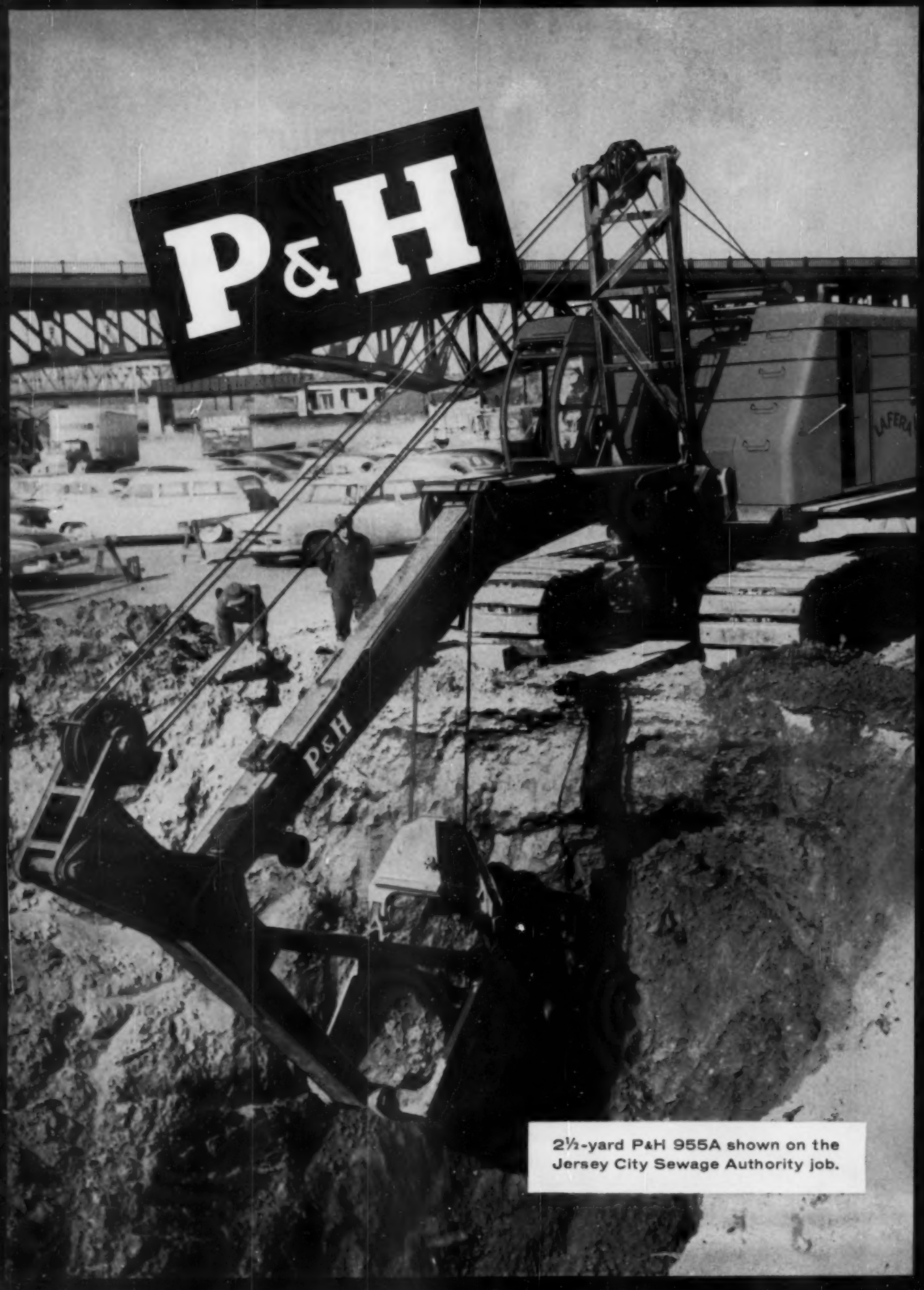
Primacord® Detonating Fuse, Ignitacord®, Quarrycord, Safety Fuse, Pyrotechnical Devices and Blasting Accessories

The square knot is used only above ground, to lengthen a trunk line of Plain or Reinforced Primacord, or to tie in Primacord M 5 Connectors. It must be drawn up tight.

Plain Primacord Trunk Line. Is used also for shallow holes — wherever resistance to abrasion and cutting is not required. Textile covered, flexible, resilient, with a tacky non-slip surface. Tensile strength 140 lbs — 1000 ft. spool weighs 17 lbs.

Plastic Wire Countered Primacord Branch Lines — Used in deep, ragged holes — and especially where metal or rigid fibre explosives containers are used — wherever strength and resistance to abrasion and cutting are essential. Armored with wire and covered with plastic material. Tensile strength 300 lbs — 1000 ft. spool weighs 33 lbs.

The knot shown is the clove hitch made in the Plain Primacord trunk line and drawn tightly around the twin branch lines.



2½-yard P&H 955A shown on the Jersey City Sewage Authority job.

9¢ a cu.yd....283½ yds.an hour*

with 2½ yd. P&H "Job-Designed" Trench Hoe

Each year more and more contractors are upgrading their equipment to the greater speed, power, accuracy and profitability of P&H "job-designed" power cranes and shovels.

The P&H 955A, pictured at the left on the Jersey City Sewage Authority job, digs 283½ cu. yds. an hour at a cost of 9¢ per cu. yd. (depreciation excluded) for the LaFera Contracting Company, Newark, N.J.

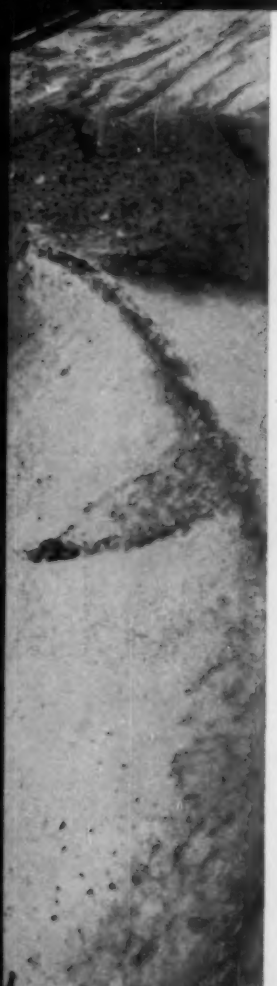
There's good reason for this typically profitable P&H performance. With the 955A it begins with Magnetorque† — the simplest and most advanced power drive known. Magnetorque transmits power for swings electro-magnetically — without friction, without wear. Swings are smoother, more easily controlled — and from 15% to 25% faster.

In addition to Magnetorque, you get P&H greater stability for more power at the tooth point — rapid reversing chain crowd for snappier dipper action — direct hydraulic control for smoother, easier control. This combination of outstanding P&H features gives the 955A the power, speed and flexibility to get the best performance out of your best operators.

Call your P&H dealer soon. No matter what the capacity needs or nature of your job, he can show you a P&H model that will help you dig more and lift more at a lower cost. Harnischfeger Corporation, Construction & Mining Division, Milwaukee 46, Wisconsin.

†T.M. Harnischfeger Corp. for electro-magnetic type coupling.

THE P&H LINE Truck Cranes: 8, 10, 15, 20, 25, 30, 35 and 40 tons
Shovels: ½, ¾, 1½, 1¾, 2½ and 3½ yards



Across the country P&H machines lead the field in power, speed, flexibility and profitable performance

INDIANA
For larger loads there is the big 3½-yard P&H 1055. At Standard Material Corporation's White River plant it is used to hold down costs in handling aggregates.

RHODE ISLAND
Gammino's of Providence depend on 35-ton P&H 555A-TC truck cranes for fast, economical performance in excavating on the big North-South Freeway job.

TEXAS
In the 1½-yard class, T. F. Jones Construction Co. profits from greater strength of the P&H 655B shown above on a Texas Highway Project in Hockley County.

*WRITE TODAY FOR VERIFIED P&H COST-PERFORMANCE FACTS

BUILD BETTER ROADS TODAY · FOR A GREATER AMERICA · See you at the ROAD SHOW CHICAGO Jan. 28-Feb. 2, 1957

Harnischfeger Corporation, Dept. 500-B
Construction & Mining Division
Milwaukee 46, Wisconsin

Gentlemen:
Please send me field report No. 5505 on the 2½-yard P&H 955A.

*Name*_____
*Title*_____
*Firm*_____
*Street*_____
*City*_____ *Zone*_____ *State*_____

News . . .

Continued from page 46

installation of asphalt membrane lining was made on the Klamath project in California, in 1947. Since that date, said Ellsperman, more than seven million square yards of this type of lining have been placed by the Bureau. Largest single installation was two million square yards placed on the Columbia River project in the state of Washington.

An asphalt membrane is a tough, pliable ¼ to ⅜-in. lining built up by spraying high softening point asphalt at high temperature directly on the prepared subgrade. This membrane then is covered with layers of earth or gravel to hold it in place and protect it against weathering and livestock damage.

Average cost of this type of lining is 80 cents per square yard with a maximum cost of $1.50 per square yard where special problems were encountered.

"In addition to being low in cost," Ellsperman reported, "this type of lining can be satisfactorily installed under nearly any subgrade condition, and in

"Phew! Suppose we hooked up with the wrong tunnel?"

cold and wet weather such as is frequently encountered in northern latitudes during the non-irrigation season. Late fall and winter are frequently the most convenient times for installing lining in operating systems, but freezing temperatures and wet subgrade conditions are prohibitive for more conventional types of lining.

"Asphalt membrane may be satisfactorily placed over frozen subgrades and sometimes, though it is not recommended, over light coverings of snow. Contributing to the low cost is the fact that membrane linings may be constructed with equipment ordinarily in possession of the average highway contractor and may be placed during an otherwise slack season."

Ellsperman said originally it was thought that a $\frac{3}{16}$-in. membrane thickness, the equivalent of about one gallon per square yard, would be adequate. Experience has proved, however, that a ¼ to $\frac{5}{16}$-in. thickness, or about 1½ gallons per square yard, gives the membrane longer life and greater protection against damage.

Another use of asphalt is for prefabricated canal linings. Manufactured in panels or rolls, these linings can be installed easily and quickly with unskilled farm or ranch labor. They are particularly useful in lining small canals and laterals.

Announce Mole Awards

Guy F. Atkinson, San Francisco, Calif., and Louis R. Perini, Framingham, Mass., have been named as the 1957 recipients of the Moles awards given annually for "outstanding achievement

now step up dragline output
with ALL-NEW BUCYRUS-ERIE BUCKETS

You swing more payload, less deadweight every hour with the new Bucyrus-Erie dragline buckets. A combination of advanced, all-new design and a new lightweight, long-wearing material makes it possible.

The new material is BECOLOY, a special steel alloy with a tough, fibrous structure ideally suited to dragline bucket service. The new design features a "slicing-action" lip that penetrates material quickly, and a tapered basket shaped to load full and fast. Proper flaring and balance minimize spilling and bobbing. The inside design is smooth and the arch is extra high for fast, clean dumping.

Your Bucyrus-Erie distributor can help you select the right size and model of these new buckets to fit your job, to bring you better output performance than ever before. Three types are available — light, medium, and heavy-duty — with either solid or perforated baskets.

13B56C

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

in construction." The Moles group is a society of leading figures in the tunneling and heavy construction industry.

Atkinson and Perini make up the 17th pair of honorees in a series that started in 1941. The awards are made annually to one member of the society and one non-member in recognition of service to the American construction industry. Perini is the member winner.

Atkinson, 81 years old, is board chairman of the Guy F. Atkinson Co., which has performed more than 100 major contracts in this country and overseas. Among them are Grand Coulee dam, Treasure Island for the San Francisco World's Fair, McNary dam and powerhouse and the Hanford (Wash.) atomic energy plants. Atkinson is a past president of the National Associated General Contractors.

Perini is president of B. Perini & Sons, a company that has figured in many large tunnel and dam jobs in the eastern United States and Canada the past 20 years. He is also president of the Milwaukee (Wis.) Braves National League baseball team. Perini and his brothers, Joseph and Charles, purchased the club in 1945 when it was a Boston (Mass.) franchise. He is a past president of the New England Road Builders Assn.

Formal presentation of the honors will be made at the annual Moles awards dinner at the Waldorf Astoria hotel in New York, N. Y., February 7.

Safety-Minded Reader Writes

Paul D. Gustafson, registered professional engineer, 2920 Pioneer Dr., Salem, Ore., has sent in the following comments concerning a recent *Excavating Engineer* article.

"I noted with interest Atlas Copco's list of 'Nine Quick, Sure Ways to Ruin Drill Steel' on page 35 in the November 1956 issue. Perhaps it would be well to add as method No. 10 the use of drill steel in place of a tamping rod for loading holes. This method has the additional advantages of ruining an occasional miner.

"Perhaps your presentation of the article may help prolong the life expectancy on steel. The industry will be indebted to you in that event."

Equipment Distributors Meet

The 38th annual convention of Associated Equipment Distributors will be held at the Conrad Hilton hotel in Chicago, Ill., January 27-30. High on the list of subjects to be discussed are distributor-contractor relations and the problems of equipment financing. The meeting will also feature an array of distinguished speakers.

More than 100 manufacturers of construction equipment and accessories will place their products on display at a special Conference, Display and Exhibit Center—termed "Condex" for short—to be held in the exhibition halls of the Conrad Hilton hotel. Covering some 40,000 square feet of exhibit space, "Condex" will open on Sunday afternoon, January 27, and will run through Wednesday evening, January 30, when the AED convention will adjourn. Meanwhile, the American Road Builders' mammoth Road Show will be in progress at the International Amphitheater during the entire week, January 28-February 2. Only AED manufacturer members not participating in the Road Show itself will display their products at "Condex."

WHEN YOU NEED A
GIANT
PULL
COST GOV'T More than Double our Price in Large Quantities
Make sure to have this
JUMBO
Galvanized Steel
TOWING CABLE
14 ft. long; 1" diam. Forged sockets at each end.
Ideal Towing Length
YOURS Now—BRAND NEW—Only....
$14.95 Pre-Paid
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Made to pull even heaviest ARMY TANKS out of ditches, slush & mire.
NECESSITY FOR:
• EMERGENCY TOWING
• ROAD GRADING
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• LOAD BINDING, LIFTING, etc.
Order Now While Limited Quantity Lasts
Rockwell Engineering Co.
Complete Line of Wire Rope Fittings, Tackle Blocks & Forgings
13,500 So. Western Avenue
Blue Island 4, Ill.

Beavers Hold Awards Event

The second annual awards dinner of The Beavers will be held January 17 at the Biltmore Hotel in Los Angeles, Cal. Featured speaker will be Dr. Abel Wolman, professor of sanitary engineering at Johns Hopkins University, and former president of the American Water Works Assn.

Special awards for outstanding contributions and meritorious service to the heavy engineered construction industry will be presented to eleven persons whose names will not be revealed until the actual time of presentation. Chairman of the awards committee is R. F. Rasey, vice president, Winston Brothers, Monrovia, Calif. Officers and directors for 1957 will also be named at the meeting.

The Beavers, formed in 1955, are an organization of contractors prominent in heavy engineered construction in western states.

Robert M. Reindollar

Robert M. Reindollar, 62, immediate past president of the American Road Builders' Assn., died November 17 at his home in Baltimore, Md., after a short illness.

Mr. Reindollar was widely known for his aggressive views favoring a national highway program. He led the battle for better highways during his ARBA presidency 1953-'54. He was one of the first to advocate a $50 billion roadbuilding program in appearances before various congressional committees and numerous audiences throughout the country.

Mr. Reindollar started his career in the highway field in 1910 as a rodman with the state roads commission of Maryland. During 1917-'18, he was employed by the Raymond Concrete Pile Co., New York, N. Y., as a superintendent of foundation work.

Returning to the roads commission in 1919, he was placed in charge of surveys and preparation of plans and estimates. In 1945, he was appointed chairman of the roads commission; he held the post until 1951. Since 1951, he has been engaged in private practice as consulting engineer on highway engineer, administration and traffic problems.

Mr. Reindollar was an honorary director of the Association of Highway Officials of the North Atlantic States and was president of the association in 1934. He also served as president of the Engineers Club of Baltimore, the Maryland section of the American Society of Civil Engineers and the Maryland Association of Engineers.

1 **Strategically located FACTORIES**

Stocking True Original Parts for continued TOP performance of your Allis-Chalmers engines.

YOU are backed up 3 deep with parts

and service...when you use ALLIS-CHALMERS engines!

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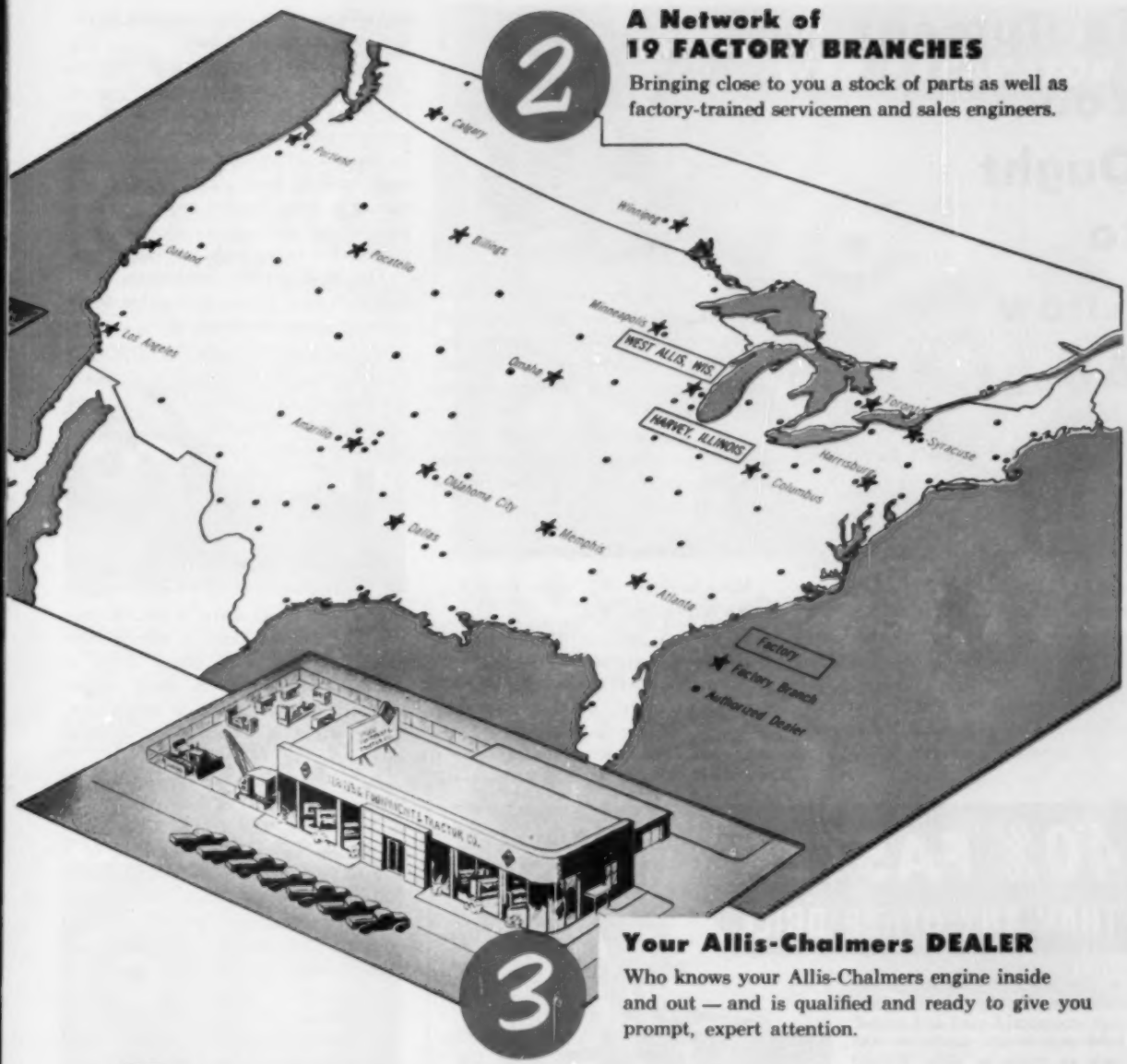


You enjoy "factory-town" service wherever you are when you operate Allis-Chalmers engines — for you are backed up *3 deep* by Allis-Chalmers' proven dealer-branch-factory system.

What does this mean? It means that your dealer is serviced from one of *19* nearby factory branches— or direct from the factory. Each branch carries a stock of True Original Parts and is staffed with factory-trained servicemen as well as sales engineers. This assures prompt attention whether you need a replacement part or technical assistance.

Ask your Allis-Chalmers engine dealer to show you how this *3-deep* service can help on your specific engine needs. Write for literature and details.

ALLIS-CHALMERS, BUDA DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

Equipment You Ought to Know About

6-in. Contractor's Pump

Manufacturer: Construction Machinery Co., Pump Div., Waterloo, Iowa.

Claims: The new model 90-M 6-in. contractor's pump features dual volute priming action for fully automatic priming. A top entrance suction connection is provided for dependability; waterways of the pump will easily pass a 2-in. solid sphere.

The machine is powered by a radiator-cooled 244-in. Continental engine, which develops a constant 55 hp at

1,800 rpm. Safety controls automatically shut off the unit in case of high engine temperature or low oil pressure. The pump is available with either skids, steel wheels, or 5.50 x 16.00 pneumatic-tired wheels.

The pump handles such jobs as dewatering excavations, cofferdams, sumps or basements, as well as transferring or supplying liquids.

Crane-Excavator

Manufacturer: Bucyrus-Erie Co., South Milwaukee, Wis.

Claims: A new crane-excavator in the 1-yd. class is now offered by Bucyrus-Erie. The 30-B model is readily convertible to shovel, dragline, clamshell, crane, or dragshovel, and is offered with five sizes of crawler mountings. It is also offered as a carrier-mounted Transit Crane, rated at 35 tons.

Main operating functions of the machine are air controlled. According to Bucyrus-Erie, proper graduation of air pressure gives the operator full-feel over his control levers. Air controlled functions include hoist clutch, crowd and retract or drag clutches, swing and propel clutches, steering jaw clutches, digging brakes, swing brake and dipper trip.

The 30-B crawler machine is available with diesel engine with either direct drive or torque converter drive, gasoline

engine with direct drive, or electric motor. The Transit Crane is offered with gasoline engine with direct drive as standard equipment. A diesel engine with either direct drive or torque converter drive is available as optional equipment.

As a crane, the 30-B crawler handles booms up to 100 feet long plus 10, 20 or 30-ft. jibs. The Transit Crane handle booms up to 130 feet long or a 110-ft. boom with a 30-ft. jib. Booms furnished with the crane are of open throat construction. The 30-B boom hoist is independent of all other functions; boom angle can be changed while the machine is swinging or propelling, while the load is being hoisted or lowered. Boom suspension can be 8-part continuous or pendant type. The pendant type, with mast, is used on all booms longer than 60 feet. Draglines are equipped with rotating fairleads. Rudomatic taglines are furnished for clamshells.

Shovel features include a new design dipper with Becoloy single or two-part teeth; a single-unit, inside rectangular type dipper handle; large-diameter boom point sheaves; and positive, independent twin rope crowd assuring both full engine power for crowding and rapid retract for fast cycles. The dragshovel has a cambered boom with handle attaching to rear of dipper and a telescopic strut on the auxiliary A-frame to prevent "kicking back" when working on steep grades—especially important to pipeliners.

40% FASTER
THAN ANY OTHER DRILL

● The McCarthy Vertical Auger Drill cuts drilling time in earth, clay, compacted sand and gravel, hard pan, shale, sandstone and rock as much as 40%. Rugged construction permits you to drive 2 to 24-inch augers to depths of as much as 125' faster than any other drill. Get the facts on the powerful McCarthy today. See how you can complete shot hole, exploration drilling, foundation holes, dewatering operations, well drilling, highway construction and heavy contract work faster than ever before. The versatile, vertical McCarthy gives you more than any other drill. Write for Bulletin M-100 now. Let us show you how you can turn new profits on your drilling job.

McCarthy Vertical Auger Drill Model 106-24

SALEM
MANUFACTURED BY
THE SALEM TOOL CO.
799 S. ELLSWORTH AVE., SALEM, OHIO, U.S.A.

Other 30-B features are low height and center of gravity for maximum stability; a spring-set and air-released friction swing brake to lock revolving frame; liberal use of anti-friction bearings; machine-cut lower propel gears; flame-hardened teeth for swing rack gear and pinion; and a remote control lubricating device, mounted on the A-frame, which is convenient for lubricating swing rack gear and pinion.

Available as extra equipment for the 30-B crawler are independent propel; a third drum and cat head which can be used with either standard propel or independent propel; and hoist-load lowering control which can be obtained for the crane, dragline and clamshell. Hoist-load lowering control is standard equipment on the 30-B Transit Crane.

Concrete Core Drilling Unit

Manufacturer: J. F. Hamlin Co., San Francisco, Calif.

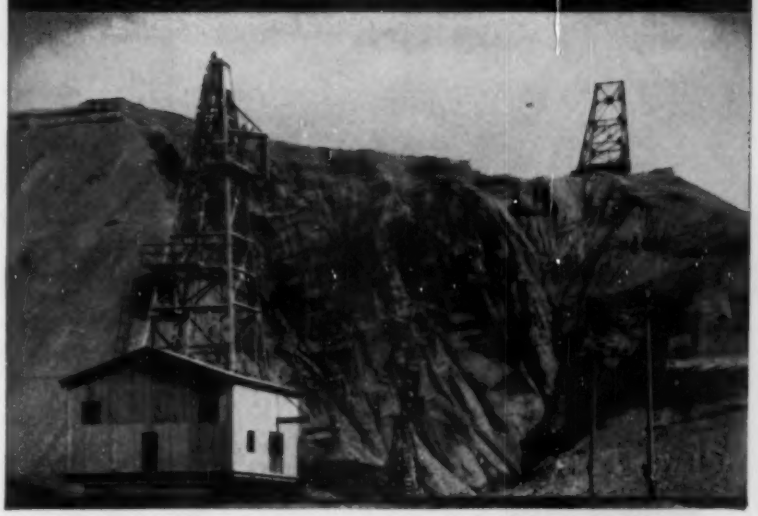
Claims: The noisy, time-consuming jack-hammering method of drilling through reinforced concrete, marble, granite, tile, and steel can be avoided by a new machine called KOR-IT. Using a General Electric NEMA 56-frame, 3,450-rpm motor, Form G, the revolutionary machine saws holes for such purposes as running conduit systems and piping in existing structures and for getting test cores from highways and buildings for laboratory analysis.

Needing only a 115 or 230-volt electrical outlet and a rubber hose attachment from a water tap, the cutting machine requires no special operating skills, and once the device has been set, no special attention is necessary.

Effective in tight locations, the drilling apparatus maintains a constant cutting speed and has a built-in counter-

Continued on page 56

720 TONS . . . AN HOUR'S HAUL WITH THIS
SAUERMAN TOWER EXCAVATOR



Pioneer's giant excavator is the largest power scraper installation in the sand and gravel industry.

Pioneer Sand and Gravel Co., Seattle, Wash., needs a huge flow of material to supply its ready-mix plants and barges. They're getting it with a 12-cu. yd. Crescent Scraper.

The Crescent handles 480 yds. or 720 tons per hr. over an average haul from 300 to 350 ft. It operates along a 675-ft. span between movable head and tail towers located at the base and top of the 240-ft. high bank.

In addition to high rate of delivery, adoption of the Sauerman Method provides two other advantages over the 5-cu. yd. power shovel that formerly operated off the "toe" of the bank. These are: (1) material can now be taken from anywhere on the bank for blending and selection of gravel, and (2) material can be moved down the slope with no danger of cave-ins.

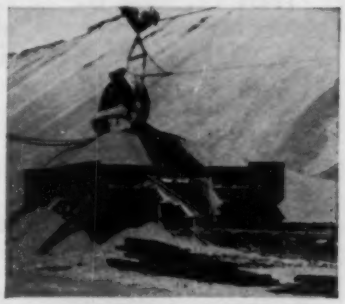
The tower excavator at Pioneer is mounted on portable towers and engineered by Sauerman for economical excavation in this type of deposit. This same digging tool . . . the Crescent scraper . . . can be engineered to your operation to give you equivalent high production at low cost.

Sauerman Scrapers range from ⅛ cu. yds. up to 18 cu. yds.

Because in most cases it is cheaper to drag material than it is to lift and transport it, *they give you the lowest cost per cu. yd. handled.*

Contact us for information and specific recommendations. Ask for field reports and Catalog A.

This view gives some conception of the height and steepness of the bank on which the Crescent works.



The Crescent delivers to a portable field hopper from which belt conveyors transport the material to the plant.

SAUERMAN BROS. INC.
622 S. 28th AVE. BELLWOOD, ILL.
Crescent Scrapers • Slackline and Tautline Cableways • Duralite Blocks

"I've been a hoisting engineer for over 45 years," states Jess Reinhart of the City of Chicago Department of Water and Sewers, "and in my opinion there just isn't any bucket that has more digging power, sheds cleaner or dumps faster than a Kiesler bucket!"

Take another look at the photo above and you will readily see the reason for Mr. Reinhart's statement. Note that the leverage of the arms—the 2 lever-arms—exerts its powerful force directly to both shells and cutting edges, thus digging in for more of a payload EVERY time. Note, too, the minimum amount of cable and reeving necessary to achieve that maximum in power and performance.

NO DEAD-WEIGHT, BUT AGE-OLD PROVEN PRINCIPLES OF LEVERAGE — backed by over 64 years of bucket-manufacturing experience . . . this is your assurance of superior performance on every job with a KIESLER bucket. . .

PROMPT SERVICE AVAILABLE

We offer complete factory service on Kiesler buckets and all buckets whatever their make. Whatever your problem, call Kiesler first.

GUARANTEE

Kiesler Buckets are guaranteed to outperform and do a bigger day's work than any other Bucket of equal weight, width and size, when properly reeved and operated.

JOS. F. KIESLER CO.

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Since 1892

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New Equipment . . .

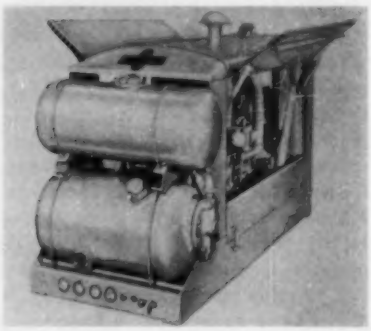
Continued from page 55

balancing device that does away with the need for external pressure.

Self-sharpening, the machine's sawing bit is faced with specially selected industrial diamonds seated in high-test steel. The diamond-faced bit is self-feeding and reacts automatically to pressures from the machine.

Easily transported, the 150-lb. machine saws 1 to 6-in. diameter holes at an average rate of 1 inch per minute. Comparatively noiseless, the unit operates vertically or horizontally. It requires no extra equipment and has been field-tested under varied conditions and applications.

Portable Rotary Compressor



Manufacturer: Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.

Claims: Ingersoll-Rand has added a new 85-cfm size to its line of Gyro-Flo portable rotary compressors. With the new model, the line now includes six sizes with capacities ranging from 85 through 900 cfm.

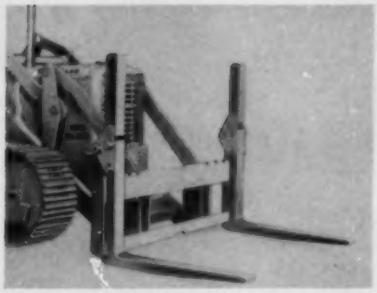
The Gyro-Flo 85 weighs 1,840 pounds fully equipped with tool boxes, fenders and two-wheel spring-mounted running gear. As a truck-mounted unit, the compressor weighs 1,375 pounds and stands 42 inches high.

Power is provided by a 4-cylinder, 4-cycle Continental F-140 gasoline engine with L-head design and individual porting. The F-140 is equipped with push button starting and a heavy-duty 6-volt battery system.

Caterpillar Attachments

Manufacturer: Caterpillar Tractor Co., Peoria, Ill.

Claims: New attachments for Cat Traxcavators and tractors have been announced by Caterpillar. Log and lumber forks are now available for the No. 977 Traxcavator. Designed origi-



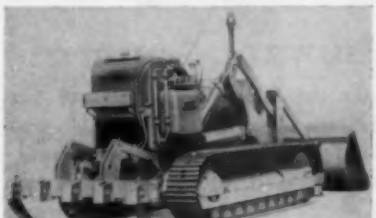
nally as a log and lumber tool, the attachment has also proved ideal for handling poles, pipe, palletized loads and other similar material.

The fork includes a carriage which is attached to the lift and tilt arms in place of the bucket. The two tines are mounted on this carriage, and can be adjusted to 45, 60, 75 and 87½-in. centers. Adjustable standards, located at the top of the tines, can be set in either a vertical or 35° forward position to provide better load-handling characteristics.

Heavy-duty hydraulic lift cylinders are offered for use with the log and lumber forks, on machines equipped with a winch or counterweight. These cylinders enable operators to utilize more fully the excellent stability of the No. 977 Traxcavator, because their greater hydraulic capacity permits the handling of larger and heavier loads. Close operator control of heavy loads is assured by the slower lifting speed of the cylinders.

Designed specifically for handling heavy material, these cylinders replace the standard cylinders on the No. 977, and are not considered necessary for normal Traxcavator work.

Two new Cat tractor-mounted rippers are designed to speed bulldozing and loading operations. The largest of the rippers, designated the No. 6 ripper is designed for use on the D6 tractor and the No. 977 Traxcavator. The



smaller model, known as the No. 4 ripper, is for use on the No. 955 Traxcavator.

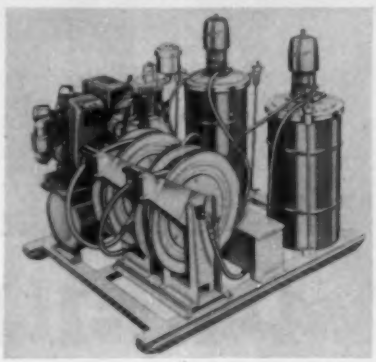
The rippers are operated by standard hydraulic controls, by making use of a separate valve and control lever mounted on top of the hydraulic tank. When the No. 6 ripper is used with the D6 tractor, it is hydraulically operated by a No. 46 or No. 44 hydraulic control and a separate hydraulic cylinder. When the ripper operates with a D6 tractor equipped with angling or straight bulldozer and a No. 46 hydraulic control, a cross-over valve must be installed.

One of the design features of the new rippers is parallel linkage, used to maintain the same angle of penetration at all depths. The use of this type of linkage permits good ripping action at any depth of tooth penetration in addition to protecting the hydraulic system by reducing cylinder pressures created while ripping.

Maneuverability of the tractors and Traxcavators is fully maintained with the new rippers. When the carriage bar is fully raised, the parallel linkage brings the teeth up close to the tractor, thus reducing over-all length to a minimum.

Excellent ground clearance is also built into the new rippers. When the ripper is fully raised, sufficient clearance is obtained to permit climbing a 30° ramp without striking the ground with the teeth. Additional clearance can be obtained by installing the teeth upside down.

Portable Field Lubricator



Manufacturer: Gray Co., Inc., 1063A Sibley St. N.E., Minneapolis 13, Minn.

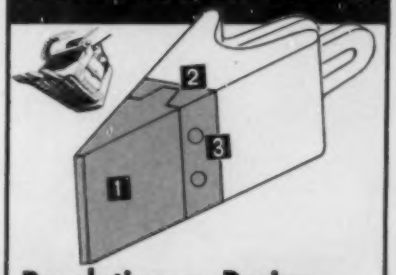
Claims: A portable field lubricator designed to be carried in pick-up trucks or trailer is offered by Gray Co. The compact, lightweight Convoy Luber is suitable for fast lube jobs, especially on equipment located at remote job sites.

The Graco unit is ready-to-operate, complete with two dispensing hose reels, high pressure and low pressure Fire-Ball pumps, 715-cfm air compressor and tool box. The entire unit is mounted on a steel frame with hardwood skids for fast, easy loading on trucks.

NEW!

Bulldog Replaceable Digger Teeth

CUT INVENTORY AND REPLACEMENT TOOTH COSTS UP TO 65%



Revolutionary Design Has Just 3 Parts

1. *Universal Weld-On Adapter* uses old tooth as a base. Saves the cost of conventional adapter or new tooth. Same adapter fits on several different types of equipment. Easily welded on worn teeth.

2. *Positive Lock Pins* that give a tight fit to the replaceable tooth and are easily removed for replacement.

3. *Easy Change Replaceable Tooth**, changed with a hammer and punch. Has reversible bevel point. Made of highest quality alloy steel—heat treated to outwear all other teeth. Field tested in taconite mines under toughest abrasive conditions, Bulldog Teeth have consistently shown cost savings up to 65%.

YOU NEED ONLY A FEW ADAPTER SIZES TO FIT ALL POPULAR MAKES OF

Shovel Dippers — Dragline Buckets
Back Hoe Buckets — Clamshell Buckets
Loader Buckets

For descriptive folder, technical data, prices, and name of your nearest dealer—

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Sales Representative and Distributor Inquiries Invited

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STEEL & TRACTOR PRODUCTS, INC.

7835 Broadway Cleveland 5, O.

DROTT 4-in-1 buckets

The Frank G. Hough Co. is pleased to announce that another valuable attachment has been added to those available exclusively for "PAYLOADER" tractor-shovels. This is the Drott 4-in-1 bucket which, coupled with the power and mobility of the current line of 4-wheel-drive "PAYLOADER" tractor-shovels, gives them greater performance on many jobs, and the ability to handle many operations that usually require special machines.

More than ever before, you get more tractor-shovel when you buy a "PAYLOADER", because you get more tractor-shovel performance and more versatility. They have power-transfer differentials — an exclusive "PAYLOADER" feature that maintains effective traction on mud, gravel, ice and snow. They have no-stop power-shift transmissions and torque converters . . . planetary final drives . . . power steering and 4 wheel power brakes. They have the exclusive bucket motion with 40° tip-back and powerful pry-out action that enables them to dig more, carry more and deliver more . . . to outperform any comparable tractor-shovels.

Your "PAYLOADER" Distributor is anxious to demonstrate what these "PAYLOADER" tractor-shovels and Drott 4-in-one buckets can do for you.

SHOVEL

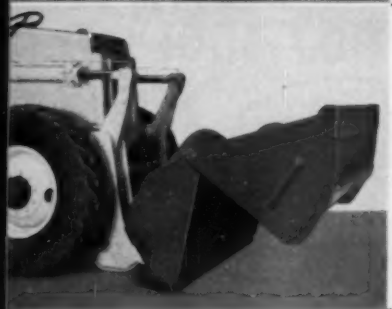
The four-in-one bucket can always be used as a regular tractor-shovel bucket to dig, carry and dump in the regular manner.

CLAMSHELL

Use the powerful clamshell action to clean up small piles, to pick up without tractor travel, to grasp and handle stumps, pipe and timbers fast.

SCRAPER

With slight clam lip opening you have a carry-all scraper that heap-loads itself, carries and spreads thin layers or dumps completely. Strips sod and grades with real accuracy.



BULLDOZER

Open the clam lip full, and you have a sturdy bulldozer with hydraulic fingertip blade-pitch control to regulate dozing depth and to discharge sticky material.

help you handle more jobs

OTHER USEFUL ATTACHMENTS

Hydraulic Back-hoes
Crane Hooks
Fork Lifts
Pusher Plates
Winches
Log and Lumber Grapples
Land-clearing Rakes
Scarifier Teeth
Special Buckets
Pick-up Street Sweepers
Rotary Snow Plows
"V" and Blade Plows

The knowledge and experience gained in 35 years, building thousands of tractor-shovels — more than all others combined — is your assurance of superior design, engineering and value when you invest in a "PAYLOADER" tractor-shovel.

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

THE FRANK G. HOUGH CO.
708 Sunnyside Ave., Libertyville, Ill.

Send full data on 4-wheel-drive "PAYLOADER" models with Drott 4-in-1 Buckets as checked:

☐ model HO 2¼ yd. ☐ model HH 1½ yd.
☐ model HU 1 yd.

Name _____
Title _____
Company _____
Street _____
City _____
State _____

14

NOT in the Contract

An enterprising sailor offered to smuggle a young woman to Hawaii and hid her in a lifeboat. After several days and night passed with the sailor spending all his spare time with the girl, she began to wonder why they didn't arrive at their destination.

Finally, she went to the captain of the boat, confessed and told him the the whole story. Then she asked: "When will we get to Honolulu?"

"Lady," the captain said, "this is the Seattle-Bremerton ferry."

Son, at college, sent his mother an itemized list of his expenses along with a request for an additional check. Mother complained to her friend that the expenses were just terrible. "And, look," she said, "it's the languages that cost the most—Scotch, $50."

Foreign woman customer (in bank): "I would lika to maka da loan."

Bank official: "You have to see the loan arranger."

Woman: "Who, plizz?"

Official: "The loan arranger."

Woman: "Oh, you mean da one who say 'Hi-ho, Silver?' "

The sweet young thing signalled a taxicab and said to the driver, "To the maternity hospital, and never mind rushing. I only work there."

"How about giving me a diamond bracelet?" proposed the extravagant wife.

"My dear," he patiently replied, "inexplicable circumstances perforce preclude the eventuality of my endowing you with such an estimable bauble."

"I don't get it," she said.

"Precisely."

Suddenly he saw a driverless car rolling slowly down the street. Thinking quickly, he ran to the car, jumped in, and pulled on the emergency brake with a jerk. As he got out, feeling proud, a man walked up.

"Well," said the hero, "I stopped it."

"Yeah, I know. I was pushing it."

Hangover: Toot ache.

A young divinity student whose father was a bishop admitted that he had used profanity.

"It was like this," he said to his father. "The ball had been passed to me . . . a long pass . . . and I caught it tight under my arm. There were only two men between me and the goal line. Interference took care of one and I dodged the other. I was within two yards of the goal post and I looked down and the ball wasn't under my arm. It just wasn't there, father. And I couldn't help saying, 'Where the hell is that ball?' "

"Well, where the hell was it?" cried the bishop impatiently.

Once there was a lion tamer who said that his father before him had also been a lion tamer.

"Did you ever put your head in a lion's mouth?" he was asked.

"Only once," said the fellow, "to look for Dad."

A tough drill sergeant was working during a hot afternoon with a listless platoon. Finally he called a halt and shouted, "You guys think you're soldiers? Why, I've seen better drilling by little cans of beer on television!"

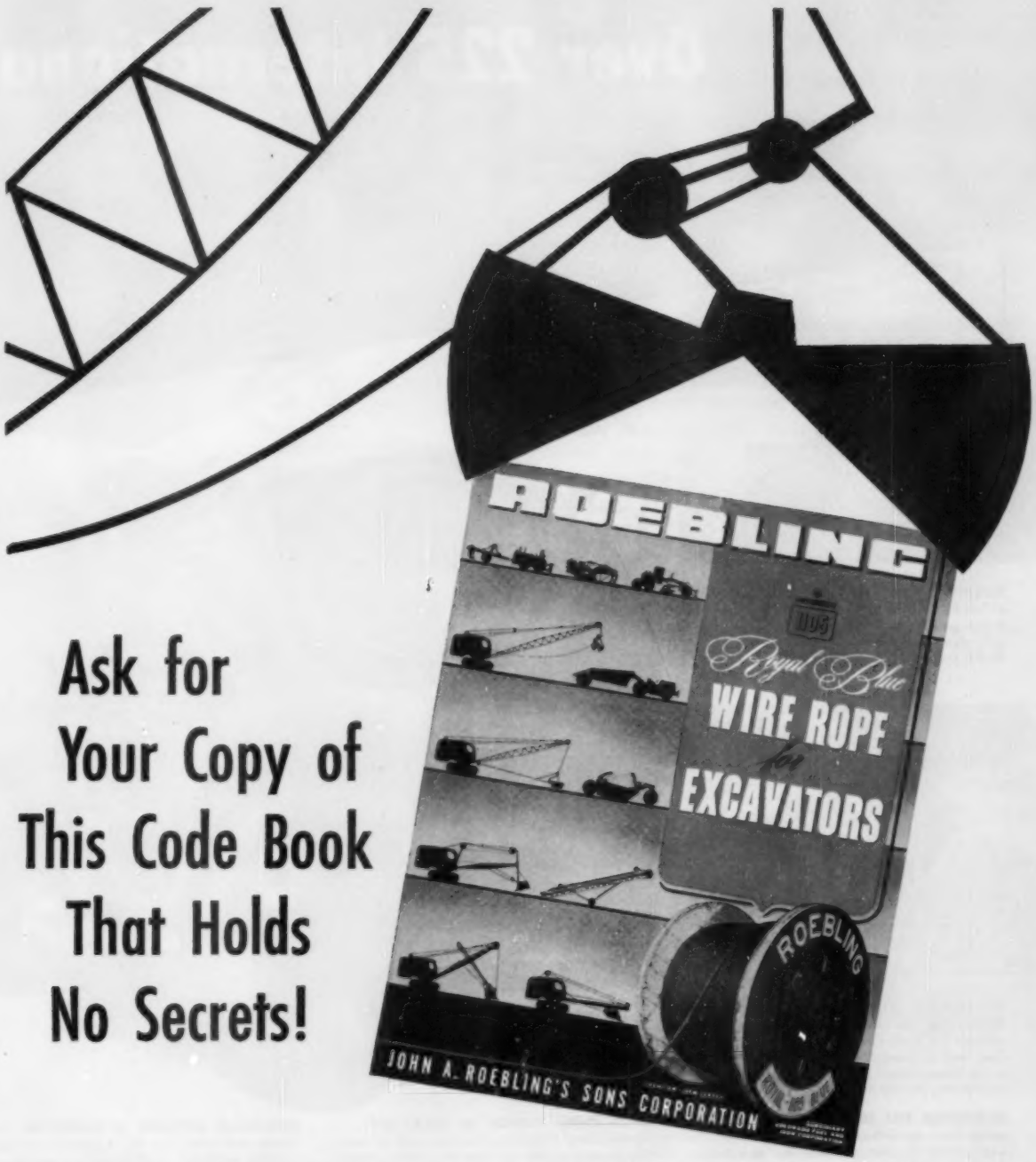
Judge: "I'm sorry, but I can't issue a marriage license until you have properly filled out your form."

Girl: "Listen, if my boy friend doesn't care, what business is it of yours?"

Advice to heavy drinkers—since you cannot refrain from drinking, why not start a saloon in your own home? Be your only customer and you'll not have to buy a license. Give your wife $55 to buy a case of cheap whiskey. There are 240 snorts in a case. Buy all your drinks from your wife at 60 cents a snort and in 12 days when the case is gone, your wife will have $89 to put in the bank and $55 to start in business again.

If you live ten years, and die in your boots with the shakes, and have bought all your booze from your wife, she will have $27,085.37 on deposit—enough to bury you respectfully, bring up your children, pay off the mortgage on the house, and marry another guy and forget she ever knew you.

"Wow! What a party last night. I hope the boss doesn't notice I have the shakes this morning."



Ask for Your Copy of This Code Book That Holds No Secrets!

If you operate excavating equipment, Roebling's new booklet, "Wire Rope for Excavators," is a must. It's chock-full of sound recommendations on where to use Royal Blue Wire Rope—the rope that's built to be stronger than the finest grade previously available.

The easy-to-follow coding system assures that you get the right rope every time. It covers hoist ropes, dragline ropes, ropes for shovels, skimmers, scraper wagons, trench hoes, clamshell cranes, slacklines, derricks, drag scrapers and bulldozers. The recommendations are for the rugged conditions you meet every day.

You'll also find supplementary data on wire rope constructions, diameters, weights and breaking strengths.

There is a copy of this 12-page booklet waiting for you. Communicate with John A. Roebling's Sons Corporation, Trenton 2, New Jersey. Your copy will be sent promptly.

ROEBLING

Branch Offices in Principal Cities
Subsidiary of The Colorado Fuel and Iron Corporation

Over 225 International have whipped tough for Brown

All over Texas the TD-14's get jobs, and *produce!*

BUILDING FIRE WALLS IN LIBERTY. One of ten TD-14 tractors, recently purchased by Brown and Root, builds roads, flood dikes, and clears land for new well sites. New TD-14 provides genuine "in-seat" starting!

SPREADING AND COMPACTING IN HOUSTON. TD-14 with both ends busy, spreads fill and compacts it at the same time with a sheepsfoot roller. Construction is for preparation of new Juvenile Detention Home site for Harris County.

SPREADING FILL IN HOUSTON. This TD-14 levels land on 360-acre naturalistic park, on south shore of Lake Houston. The new bonus-powered TD-14 has new bridge-strong box-beam track frames—for big-capacity, tough-material dozing!

BACKFILLING TRENCH IN TEXAS CITY. A 74-mile long, 8-inch pipeline from Hull to Texas City undergoes its last operation with another TD-14. Cerametallic engine clutch facings reduce operator effort and prolong clutch life in fast "shuttle-dozing" like this!

REPLACING PIPELINE IN HOUSTON. Stationed near home, this TD-14 joins a trench-hoe to move muck for pipeline replacement in railroad yard, at Sheffield Steel Company. In muck, mud, or water, new track roller seals save inspections...exclude grit, retain lubricant.

TD-14's jobs everywhere and Root, Inc.*

and associate Companies

BROWN AND ROOT RADIO-DISPATCHED TRUCK with International TD-14 gets "go-ahead" from dispatcher. Because of modern methods, Brown and Root TD-14's can be on the job anywhere in East Texas in just a few hours. No special haulage permit needed to transport the easy-to-truck TD-14!

International TD-14's give big contractor "middleweight" mobility and heavy work *power-punch*... to profitably finish jobs fast!

Internationally-famous contractor, Brown and Root, Inc., take the tough jobs wherever they are, from Guam to Guatemala—from Alaska to Calcutta. On work requiring 70-80 dbhp, they have purchased more than 225 International TD-14 crawlers to get unmatched job-to-job mobility and big capacity.

Another big reason for this choice, the TD-14 starts seconds-fast in all weather with famous International gasoline-conversion diesel starting. It's on the job fast without profit-gobbling delays!

Another big reason, new built-in operating ease, control tower visibility, hydraulic booster steering, clean geared-for-action deck, adjustable deep-cushioned seat. ALL add job-getting efficiency and cost-cutting capacity!

Other reasons: low operating cost; servicing ease! The heat-defying new Cerametallic engine clutch facings increase life, save adjustments! Famous micrometric fuel pump precision saves fuel, postpones overhauls. New track-roller seals hold greasing to 500-hr. intervals!

Reasons like these are why contractors everyhere are standardizing on bonus-powered International crawlers! Try one on your next job. Your International Construction Equipment Distributor will gladly demonstrate!

BREAKING DOWN RICE LEVEES IN ANAHUAC. Not all of Brown and Root Corporation's TD-14's work on industrial projects. This one tears down rice levees on a special assignment when oil field or other work is slack.

INTERNATIONAL HARVESTER

INTERNATIONAL® Construction Equipment

International Harvester Company, 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Side Boom Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Trucks . . . Diesel and Carbureted Engines . . . Motor Trucks

Storage tank (foreground) has been removed by H-3 Hydrocrane which is now enlarging the hole prior to installing new tank.

Rocket . . .

Continued from page 33

handled recently by Rocket for the Arlington Corp., a St. Paul manufacturer of metal products. A pair of 12-ton presses and a pair of 15-ton press breaks were taken out of a factory building and moved out of state. The heavy lifts were made by the 15-B Transit Crane which placed the machines on low-boy trailers.

Another type of industrial job that is a natural for the Hydrocrane's hydraulic control is handled periodically by Rocket for Minneapolis-Moline Co. The H-5 loads rubber-wheeled farm tractors on flat cars for rail shipment to distributors. About 20 tractors weighing 4,000 to 5,000 pounds each are loaded at the manufacturing plant in four hours time.

The procedure is for the shipper to chart out the number of units each flat car will receive. Wood blocking is then placed at predetermined positions and the Hydrocrane lowers the tractors into

At work are Mrs. Hanson and her daughter, Bonnie. Portrait in background is of the late Perry Hanson, firm's founder.

position on the blocks. The wheels of the tractors fit much more tightly between the blocks than if the blocking was performed after the tractors were already in place. Also there is little danger of the blocks coming loose because the weight of the tractors holds them down.

The ability of the Hydrocrane to move a load up or down an inch at a time, a necessity for transfer work, also comes in handy in erecting work. When a church was built at Mound, Minn., the H-5 erected laminated wood trusses for the roof arch. The sections were 30 feet long and weighed 3,000 pounds. After unloading the beams from a Rocket flatbed trailer, the H-5 lifted each of the six trusses into position for bolting. The difficult job of lining up bolt holes with connectors was simplified by hydraulic control. Very slight adjustments of position were made by actuating the hydraulic ram and sheaves apparatus which pays out the hoist line.

All six beams were erected in two hours. The crane was equipped with a special three-piece boom which provided 50-ft. reach.

Unload Concrete Beams

During the renovation of the electrical engineering building of the University of Minnesota in Minneapolis, the 15-B Transit Crane was put to work. The 15-B first unloaded 50 heavy prestressed concrete beams manufactured by Prestressed Concrete Products Co., Minneapolis, whose hauling is handled by Rocket. The 28-ft. beams weighing 4,500 pounds were used as floor supports. Because the walls of the building were intact, the beams had to be brought in through a narrow entrance way. By lowering the boom to a horizontal position and backing the Transit Crane toward the building, the crane operator nosed each beam through the doorway. The beams then were lifted into position.

Other jobs where the Rocket cranes have done excavating or structural erection include the Prudential Insurance Co. home office building; the Minneapolis Central Warehouse; and the Minneapolis War Memorial Building.

About 52 persons are employed in the Rocket organization. There are 40 drivers; five maintenance men; and seven administrative and sales personnel. C. L. Christopherson is sales representative; Walter Ludwig, assistant dispatcher; George Hilgers, accountant; and Loren Johnson, shop foreman.

Connecticut . . .

Continued from page 29

Lester Keating and Joseph DeMiceli, chiefs of party.

A 10-mile round trip to haul and place 1,300,000 yards of borrow is the lot of a joint venture of A. J. Orlando Construction Co., and Edenwald Construction Co., both of Whitestone, N. Y. Their 1¾ mile long contract, which was awarded on a bid of $7,436,750.88, is largely elevated. The job, which extends from Kings Highway in Fairfield to west of State Street Extension in Bridgeport, has 11 structures.

The joint venturers have subbed the bridge work to the Grow Construction Co., New York. Grow, in turn, subbed the pile driving work to the Horn Construction Co., New York.

Orlando and Edenwald have only 300,000 yards of earth excavation on the right-of-way. More than five times that amount of fill is needed for the approaches to the many structures. The contractors found an 80-acre borrow area five miles from the job site, on a hillside offering a beautiful vista of the Merritt Parkway.

During the fall, three Bucyrus-Erie shovels—a 3-yd. 71-B and two 51-B's with 2½-yd. dippers—loaded out about 10,000 yards of borrow per 10-hour day.

The 51-B's were averaging about 3,000 yards of excavation per day; the 71-B was averaging 4,000 yards. The material, which contains boulders of various sizes, is difficult to dig. Twenty White 20-yd. dump trailers and 30 Mack 12-yd. dumps haul the material from the shovels to the fill areas.

Install Sewers

Two Lorain 820 draglines with 4-yd. buckets are being used on the project. One of the pair was digging trench for storm pipe during the visit.

The contractors have approximately 35,000 feet of storm and sanitary pipe to lay. Also on the job are five Cat D8 and D7 tractors and a Bros wobble wheel roller.

Grow will pour 23,000 yards of concrete for structures. This firm is using a Lorain MotoCrane. Horn has a 38-B pile driver and a P&H truck crane.

A. J. Orlando and Mike Adams, an Edenwald partner, are personally supervising the work for the joint venturers.

UP WITH PROFITS
DOWN WITH... EXPENSES!
A more efficient dragline bucket scoops up bigger profits for you. Omaha Dragline Buckets eliminate unnecessary weight making room for a bigger payload. Time and dollar consuming field repairs are reduced. You can't put a better bucket than an 'Omaha' on any job.
Write today for catalog giving specifications for four types available.
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ROAD

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INTERNATIONAL AMPHITHEATRE

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CHICAGO

STANDS UP TO SEVERE USE

and even abuse

One word describes a Hayward — *ruggedness.* Yes, it's as tough, strong, sturdy as a bucket can be — and even more so. Extreme simplicity little if any upkeep, high operating efficiency! Details on request. Write! THE HAYWARD COMPANY, 50 Church St., New York 7, N.Y.

HAYWARD BUCKETS

CLAM SHELL • ELECTRIC • ORANGE PEEL • GRAPPLES

famous for performance since 1888

Dredges . . .

Continued from page 45

has a hull measuring 150 x 150 x 9 feet. Its spuds are 37 inches square and 70 feet long. A 1,000-hp Busch-Selzer engine provides the main source of power for the *Conical,* whose machinery was built by the Marion Power Shovel Co., Marion, Ohio.

The *Conical* uses 5½, 6, 9 and 12-yd. buckets, the capacity depending on the hardness and density of the material. The outer 150 feet of its boom is of aluminum. The boom has a 24-ft. spread at the base. The *Conical* carries 40,000 gallons of fuel and 1,100 gallons of water.

Tied up to the rear of the *Conical* is a quarter boat, the doubledeck *Sternee.* The hull measures 80 x 26 x 6 feet. The house, which is 76 x 21 x 18 feet, has accommodations for 29 men. It has a galley, dining room and day room. The boat carries 37,000 gallons of fresh water and 9,000 gallons of diesel fuel.

The *Sternee* normally takes power from the *Conical* for lights, pumps and refrigeration, but the boat has its own diesel-powered generator if it becomes necessary to isolate it from the dredge.

Waste material from muck excavation is being disposed of west of the toe of the slope of the hydraulic embankment.

M. R. Fridge is chief engineer for the McWilliams-Jahncke joint venture.

The overall length of the 3,012-ft. Pass Manchac bridge includes a 285-ft. cantilever span and a 125-ft. main span. Opposite ends of the span will have 40-ft. I-beam spans—15 on the north and 13 on the south. Five 80-ft. spans precede the cantilever span on the north. Two 80-ft. spans are between the cantilever and the relief opening, an 85-ft. fixed span on the south.

Twelve 80-ft. I-beam spans will be between the relief opening and the thirteen 40-ft. I-beam spans on the south end.

Provide Ship Clearance

Vertical clearance at the main channel will be 50 feet; the relief channel will have 56-ft. clearance. Square precast concrete bents are used on all the 40-ft. spans; on others, 36 and 54-in. round prestressed precast hollow concrete cylinder piles will be employed. The main opening will have nine 54-in. round prestressed piles; the relief piers have nine 36-in. round piles. Square piles from 16 to 24-in. square are used on the approach spans.

The 3-pile 54-in. bents at the main channel are designed so that they will still hold if either of the outside piles is knocked out.

Maximum grade on the bridge will be 5½%. Clear roadway width will be 28 feet. Safety curbs 1 foot 6 inches wide will be provided. At low water, the bridge will be 61 feet 8 inches above the surface.

Officials of the bridge designing section of the Louisiana Department of Highways are pleased with results of using the precast and prestressed piles. The department awarded an advance test pile contract to determine the length of the piles so that full economy could be gained in the bids.

"You may find him a bit stubborn."

Montgomery Dam . . .

Continued from page 43

Drilling Co. of Los Angeles, Calif., operating for Fisher under a specialty subcontract. This firm was using three diamond-pointed core drills and two Gardner-Denver grout pumps. Grouting stages were set at 16, 50, 100 and 150 feet. The highly seamed, fractured formation required the pressure pumping of more than the average amount of cement to seal off all the subterranean openings and make the foundation truly watertight.

Fisher Contracting Co. is a leader among heavy construction firms in the practice of a safety program. The program is backed by a workable top policy originating in the Phoenix headquarters office. There were many visible signs of a safety program at Montgomery Dam. Loose rock from the quarry wall was scaled down regularly to protect workmen below. Regular safety meetings, posters, bulletins, and other such accident prevention measures were part of the safety program.

The company maintained no construction camp at the dam site, because the towns of Alma and Fairplay were within 10 miles of the project. Many of Fisher's permanent key employees had house trailers in which they followed the work.

Special Maintenance Problems

Equipment maintenance and repair was perhaps a more ticklish problem under Montgomery Dam's conditions than it would have been at lower altitudes. Because of the extreme altitude, engines had to be tuned to the last degree of perfection. The hard granite rock was abrasive. Much preventive hardfacing was necessary on shovel dipper teeth and lips. The hard rock also was tough on rubber tires, but that problem was eased a bit by using spotters at the shovels with orders to keep puncture-type rock thrown out of the way.

Fisher's field operations were under the general supervision of Warren Hunter, construction manager, whose headquarters are at Phoenix. Kenneth Willis, project superintendent, had overall charge of Montgomery Dam's construction activities. His assistants included two superintendents: Pete Wahlin, on the first shift, and Doil Yocham, second shift. Dan Broderick was quarry foreman; Ed Pound, project engineer; Gus Zarka, equipment foreman; and Tom Bosley, office manager.

No hydraulics to break, leak or freeze-up!
No small front steer-wheels to align!
No tie-rods to bend!
No springs to break!
No frame to warp!
No long drive-shaft to maintain!

Cuts your hauling costs!

Tournapull Rear-Dump overcomes most maintenance problems of conventional haulers

Construction of Tournapull Rear-Dump is radically different (and much simpler) than that of a conventional heavy-duty hauler. In place of a foundation frame and body sub-frame, Tournapull Rear-Dump hitches rear and front wheels through a horizontal yoke extending back from the kingpin, and pivoted to body itself just above and ahead of rear wheels. Body is simpler, much stronger . . . has no frame and sub-frame to get out of line.

Look at the photo above . . . note the absence of springs, spring hangers, and tie-rods. Low-pressure tires adequately absorb the shocks of rough haul-road travel and shovel loading. Eliminated are spring maintenance, replacement time, and cost of spring parts.

Front-wheel drive and kingpin-type power steer helps simplify Tournapull construction, too. No longer must power be carried back to the rear through a drive-shaft. Bearing and lubricating problems of a long drive-shaft are eliminated. No longer is steering handled by small front wheels subject to "bulldozing" and misalignment. There are no tie rods, no hinged steering connections to become twisted or bent.

Nor do you have the troubles of hydraulic hoists or gravity dumping with these Rear-Dumps. Dump is by an electric winch, that lifts the body up on twin cables. Operation is under complete control at all times — with positive power for dump and return controlled by an electric switch on the dash. There are no oil seals, hydraulic pumps . . . no high-pressure lines and jacks to keep tight . . . no freezing up in cold weather as with hydraulics. There are no shock loads as in gravity dumping. You save on regular maintenance time because there is no hoist mechanism to check . . . only a few places to inspect and lubricate.

Let us show you how these savings can put money in *your* pocket. For proof, we'll be glad to show you performance figures from a job like yours. Or, if you wish, we'll give you names and addresses of nearby owners of Tournapull Rear-Dumps, so you can check the facts for yourself.

Model D — 11 tons, 138 hp

Model C — 22 tons, 208 hp

Model B — 35 tons, 293 hp

Now available with optional tailgate. Prime-mover also powers interchangeable scraper, bottom-dump, flat-bed, crane, logging arch.

Tournapull—Trademark Reg. U.S. Pat. Off. R-1171-G-b

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WHERE QUALITY IS A HABIT

ERIE CLAMSHELL BUCKET HELPS SAVE NIAGARA FALLS FOR AMERICA'S HONEYMOONERS

ERIE buckets are seldom cast in a romantic role. Made to give fuller payloads, to last longer with less maintenance, they're "tough guys" on the stage of the world's work.

This tough reputation caused Walter S. Johnson Company, Inc. to choose an ERIE for the rough, tricky rock surgery work needed to save Niagara Falls for lovers and nature lovers. This was done by slicing off a section of cliff to give the falls a new 90-ft. high vertical face with increased resistance to undercutting by the turbulent river. Section removed was 190 ft. high, contained 15,315 cubic yards of rock.

Rough going? Not for an ERIE—the "bucket that's made for the job." Check the ERIE's features—then compare prices!

Some Plus Features ERIE Buckets Provide:

1. Balanced clams give equal crowding on both closing edges at all times.
2. Narrow, rigid, one-piece, welded head. Eliminates wobble. Prolongs bucket life.
3. Block and tackle plus lever arm construction for extra closing power.
4. Extra heavy steel clams that are "clean as a whistle" inside. No space hungry stiffening plates to build up deposits and reduce payloads.

For catalogs, write Dept. E17

We will attend A.R.B.A. ROAD SHOW JAN. 28—FEB. 2, 1957

ERIE

ERIE STRAYER CO.

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New Trade Literature

Subject: **Ford Trucks**

Content: A new booklet showing how to match the right kind of truck to any construction hauling job has been published by Ford Div., Ford Motor Co. The 20-page publication points out that even though the construction industry is operating at its all-time high, profit margins are shrinking. It shows a wide selection of specially built bodies for use in construction work, together with Ford truck models best suited for the full range of operations in commercial, industrial, residential, highway, and public construction jobs. Four special tables are included, matching special dump body, rock body, ready-mix dump, and transit mix capacities to Ford's truck models. An over-all table shows general construction industry applications which are met by combinations of 25 conventional Ford truck models on eight different wheelbases, with six horsepower ratings ranging from 212 hp V8 to 133 hp six.

Where to get: Ford dealers, or Truck Marketing Dept., Ford Div., Ford Motor Co., Box 608, Dearborn, Mich.

Subject: **Ditcher Catalog**

Content: Recently introduced Gar Wood-Buckeye 305, 307 and 308 pipeline and utility ditchers are discussed in a 16-page catalog. The illustrated booklet lists a number of new engineering developments, including the Gar Wood-Buckeye hydraulic conveyor drive, live hydraulic wheel hoist controls, specially designed traction and digging transmissions and other new features.

Where to get: Customer Service Dept., Gar Wood Industries, Wayne, Mich.

Subject: **Caterpillar Booklets**

Content: A comprehensive operator's guide for Caterpillar wheel tractors and scrapers is now available. The 24-page booklet describes the proper op-

Continued on page 72

TO ADVERTISE: All advertising in this section is payable in advance. Rate: $1.00 per line, or $12.00 per inch of 12 lines. Minimum charge $4.00. No discounts: no commissions. Please count your copy carefully, to avoid delay. Each line contains 41 character: (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

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FOR SALE
CONSTRUCTION EQUIPMENT

1201 Lima Dragline, 85', 3 yd.
955 P&H Dragline, 90', 2½ yd.
54-B Bucyrus-Erie Drag, 85', 2½ yd.
54-B Bucyrus-Erie Comb. Drag & Crane
1001 Lima Dragline, 80', 2½ yd.
80-D Northwest Drag, 65', 2½ yd.
802 Lima Cranes
604 Lima Comb. Shovel & Crane
25 Northwest Combination Shovel & Crane
80-D Northwest 2½ yd. Shovel
3000-B Manitowoc 2 yd. Shovel
38-B Bucyrus-Erie 1½ yd. Shovel
44 Lima 1 yd. Backhoe
LS-85 Link Belt 1 yd. Shovel
General 1 yd. Shovel
34 Lima ¾ yd. Shovel
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Bay City, Lorain, P&H & Osgood Truck Cranes
Shovel, Drag, Crane & Backhoe Attach. —Drag & Dipper Buckets for most makes and Models
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Garwood, LeTourneau, Caterpillar, Euclid & Bucyrus-Erie Scrapers
Huber 3-5 ton Tandem Roller
Buffalo-Springfield 10 ton Roller
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313 Hazleton Nat'l. Bank Bldg.
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Bucyrus-Erie 200-W diesel dragline shipped in 1950; 125 ft. boom, 6 yd. heavy duty and 7 yd. light weight buckets; some spare parts included; good mechanical condition. Location Melbourne, Australia. Box 3682

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Model 175 Bucyrus-Erie electric dragline, rail mounted, 125' boom, 5 yd. bucket.
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Central Florida location—priced as is or loaded for rail shipment.

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Phone 2341 or 2881

2-W Monighan Walking-Type Dragline #492, 85' boom, 2-year old D-13000 Caterpillar diesel engine #4S685, 2-yard Hendrix bucket, 2½ yard Page bucket, some spare parts, fair operating condition. Box 3708

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MANITOWOC MODEL 3500 STRIPPING SHOVEL, S/N 3602; equipped with 45' boom, 34' sticks and 2 cubic yd. dipper; powered with Caterpillar D-17000 diesel engine new in 1951; machine is in good operating condition. Price $35,000 as is, where is, and can be inspected at Sunnyhill Coal mine near New Lexington, Ohio. Box 3692

Lima model 34 dragshovel; ¾ yd. bucket crawler type; 20' cambered boom; GMC 3055-C diesel engine; year 1951; price $11,500.
Lorain model TL-25 shovel combination ¾ yd. shovel and 36" backhoe; crawler type; Cat. D315 diesel engine; year 1950; price $9,500.

DOW & COMPANY, INC.
1820 Elmwood Avenue Buffalo 7, N.Y.

Bucyrus-Erie 15-B dragshovel, ½ cu. yd. with 20" treads. Buda gasoline engine, electric starter. Serial number 23325.

Koehring model 303, ¾ cu. yd. backhoe with 24" crawlers. Buda gasoline engine. Good buy.

Lima model 1201, combination 3½ yd. shovel and crane, 60' crane boom and two 10' inserts equipped with Cummins diesel model "L" engine.

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Model 14 Browning 20 ton truck crane with 50' boom and pendant suspension. Upper works equipped with 6 cylinder Waukesha gasoline engine, all mounted on Dart Model 200-456 carrier unit with 6 cylinder Waukesha gasoline engine. The machine was new in 1953 and the entire unit is in excellent condition with the carrier unit only having about 1500 miles on it. Upper works S/N 41415A; carrier S/N 214/10; upper works motor no. 929566; carrier motor no. 93416B.

Price $16,500

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SMALL SHOVELS, CRANES, DRAGLINES — UP to 2½ YDS.

Bucyrus-Erie 22-B, Caterpillar D318 engine; machine used only part time; absolutely perfect throughout; must see to appreciate; ¾ yd. rock bucket; excellent undercarriage; financing available. Call or write Midland Machinery Co., Chillicothe, Mo. Phone 280.

Bucyrus-Erie 10-B crane, gas engine, serial #14448, AS IS.
Price, f.o.b. Greensboro, N.C. $1,500
Allis-Chalmers TS-200 motor scraper with A-C diesel engine.
Price, f.o.b. Greensboro, N.C. $17,500
Jaeger 600' compressor with Murphy diesel engine, on 4 pneumatic tires.
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Allis-Chalmers HD-15A diesel crawler tractor with Baker 15 GC gradebuilder and Gar Wood 281 PCU.
Price, f.o.b. Greensboro, N.C. $13,000
15-B Bucyrus-Erie dragline, Cat. diesel engine with electric starter, serial #115288, used approximately 550 hours.
Price, f.o.b. Greensboro, N.C. $21,000

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USED HYDROCRANES

2—H-3 HYDROCRANES on L-170 I.H.C. truck, equipped with tagline reel and clamshell bucket; repainted and ready to work.
2—H-2 HYDROCRANES (2-ton) in working condition; call or wire for location to inspect.

USED EXCAVATORS

2 yd. SHOVEL-CRANE DRAGLINE MODEL 820 LORAIN Cat. D-13000, 70' boom, fairlead, maximum counterweight, extra parts, and 2 yd. AMSCO shovel dipper. Lots of machinery at a price!

¾ yd. MODEL 25 NORTHWEST CRANE-SHOVEL COMBINATION, Cat. D-4600 diesel engine, 45' crane boom; very good condition and priced right.

1 yd. SHOVEL MODEL LS-90 LINK-BELT in like-new condition, hoe or crane equipment available, as desired. Save $$$$ on this rig!

⅝ yd. CRANE-CLAM COMBINATION MODEL 255 P&H, with grouser type crawlers; workable at a give-away price. Just the rig for winter rebuilding!

½ yd. CRANE-CLAM COMBINATION MODEL 357 UNIT, self-propelled, rubber tired wagon carrier, very good condition; new boom 30'. A good buy!

⅜ yd. BACK-HOE MODEL 10-B BUCYRUS-ERIE, very good condition. Priced to move!

OFFERED SUBJECT TO PRIOR SALE

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Used Bucyrus-Erie excavators—cranes, shovels, and draglines—in the following models: 15-B, 22-B, 38-B, 54-B. We will take them in trade or will purchase outright.

WRITE OR CALL:

J. P. WAITE CONSTRUCTION CO.
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SMALL SHOVELS, CRANES, DRAGLINES—UP TO 2½ YDS.

FOR SALE

BRAND NEW—1201 LIMA DRAGLINE

85′ Boom, 3 yd. Bucket
Used One Week
Job went sour — Owner
will take substantial
loss.

FRANK SWABB EQUIPMENT CO., INC.

313 Hazleton Nat'l Bank Bldg.
Hazleton, Pa. GLadstone 5-3658

Lima model 703 shovel with long crawlers, G-M diesel engine with torque converter, with shovel attachment, 23′ boom and 20′ dipper handle, 1¼ yd. bucket—200 watt 115 volt DC Kohler lighting plant s/n 331822, 7 months old, stripped 15,000 tons coal. W. T. NEWPORT, Brown Hotel, McMinnville, Tenn. Phone 2134.

MISCELLANEOUS EQUIPMENT

Bucyrus-Erie 10-B ¾ yd. shovel attachment, front end complete, like new condition. Price: $300; counter weight 2000 lb. Price: $125. Spare parts cheap. McCandless Cons. Co., 1625 E. Kearney, Springfield, Mo.

HD-15, 3 cu. yd. high lift, S/N 1723 with G.M.C. 6-71 engine. Purchased new 1953, excellent condition, heavy duty rails, $10,250. RIEMER BROS., INC., 9800 West Waveland, Schiller Park, Ill. Phone GLadstone 5-6330.

Bucyrus-Erie model 27-T blast hole drill in near new condition, complete with eight bits, two stems, telescoping boom, Hercules gas power: $7,500.

JAMES W. BELL CO., INC.
Box 550 Cedar Rapids, Iowa

Lima 1201 diesel 3½ yd. crane-shovel.
Plymouth 35 & 25-ton gas locomotives.
Westinghouse-Baldwin 125-ton 600 HP electric trolley-diesel locomotives (16).
Johnson-Erie concrete batch, mix plant.
Noble batch plant, 100 cu. yds. per hour.
Placer dredges, 4½′, 12′, 16′ (2 abroad).
Bucyrus Walker dragls., 9, 6, 5, 200-W.
Colby hammerhead crane, 300′, 15-ton.
Shovels, cranes, dragls., 1½ to 18 yds.
S/L derricks, steel, 75, 35 and 20 tons.
Rotary kilns, dryers, 10x101, 9x140, etc.
Diesel-elec. generators, 500 to 1000 KW.
Euclid diesel 15-22 ton end dump trucks.

H. Y. SMITH COMPANY
828 N. Broadway Milwaukee 2, Wis.

IF YOU ARE BUYING OR SELLING USED EQUIPMENT, THIS IS THE PLACE TO LET THE EXCAVATING INDUSTRY KNOW ABOUT IT.

MISCELLANEOUS EQUIPMENT

L-41 Lorain shovel front; excellent condition, ¾ cu. yd. dipper, laggings, etc. Complete. F.O.B. Nashville, Tenn. $1,500

McDOWELL and McDOWELL
Box 1144 Nashville, Tenn.
Phone, ALpine 5-0304

New 18″ dredging pump, rectangular cross section casing, high alloy steel liners, high alloy cast steel 4 van runner; spare liners. Box 3696

EQUIPMENT WANTED

Contractor planning trip through the mid-west and southern U.S.A. January and February, is interested in contacting dealers in excavating equipment. Box 3706

HELP WANTED

WANTED

Assistant Sales Manager

To represent nationally known Ohio manufacturer of crawler tractor parts. To contact established distributors and expand our market with additional tractor products over the United States. Must be free to travel extensively. Need car, but much of travel could be by commercial air lines. To work with our 24 experienced direct district factory representatives over the entire country.

This is an excellent opportunity for a young man seeking a future with a reputable firm thirty-five years a basic manufacturer. Expenses paid, salary and incentive program.

A complete fundamental knowledge of crawler parts and tractor repair service operation necessary. Write particulars stating age, marital status, past and present employment and experience. References required.

Box 3705

JOIN THE MARCH OF DIMES IN

New Literature . . .

Continued from page 70

eration of rubber-tired earthmovers in all phases of their work. It contains detailed tips on loading, hauling, dumping, and returning. Color illustrations explain proper shifting and use of the scraper controls. To enable an operator to grasp quickly basic service checks on his equipment, the booklet includes an easily understood checklist of important pre-operation checks. Ask for Form 32022. *Speaking of Attachments* is the title of another 8-page Caterpillar booklet dealing with the profit-making aspects of earth moving machinery attachments. The illustrated booklet demonstrates how the right attachment and the proper application combine to produce increased profit for machine owners. Also included are tips on determining when and where attachments can be profitably used. Ask for Form DE 589. Copies are available in Spanish, French and Portuguese.

Where to get: Caterpillar dealers, or Caterpillar Tractor Co., Peoria, Ill.

Subject: **G-M Turbopower Diesels**

Content: A 4-page bulletin describing General Motors Turbopower diesel engines has been issued by the Detroit Diesel Engine Div. Specifications of industrial and marine models ranging from 159 to 300 brake horsepower are fully described along with features of design and performance data.

Where to get: Detroit Diesel distributors and dealers, or Detroit Diesel Engine Div., General Motors Corp., Detroit 28, Mich.

Subject: **Hyster Attachments**

Content: Hyster's booklet, *9 Profitable Minutes for Contractors*, again is available for distribution. The brochure, with a reading time of nine minutes, outlines methods of increasing productivity through use of Hyster job attachments on either new or used tractors. It is prepared from on-the-job case histories. Many of more than 30 different Hyster attachments are pictured and described. The two-color booklet is prepunched to fit into a standard three-hole ring binder. Ask for form No. 1305.

Where to get: Caterpillar-Hyster dealers or by writing to Hyster Co., 2902 N.E. Clackamas St., Portland 8, Ore., or 1800 N. Adams St., Peoria, Ill.

NEW "KING-SIZE" CARTRIDGES SAVE TIME AND LABOR

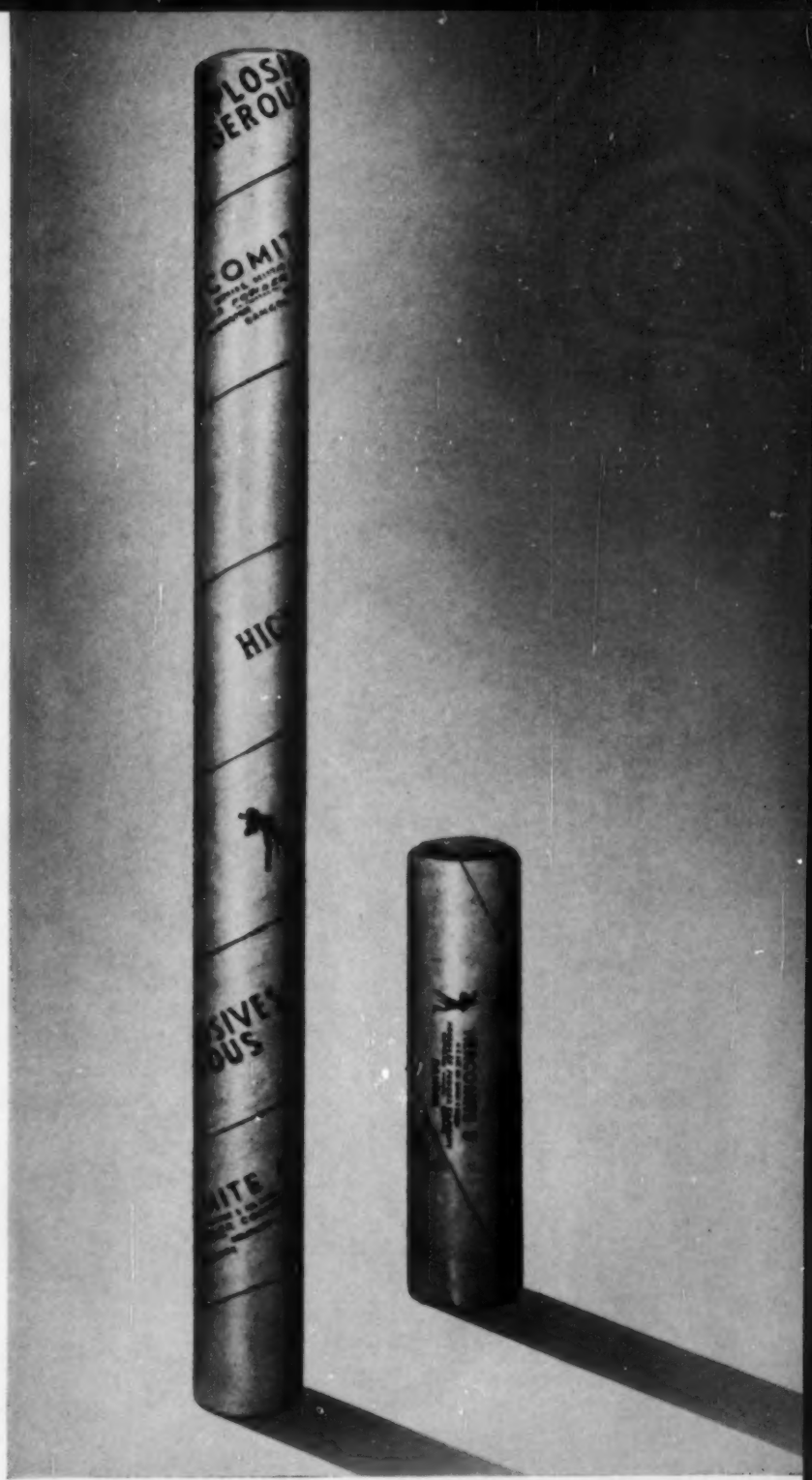
Now, Hercules produces "King-Size" cartridges in lengths of 24, 20, 16 and 12 inches, and in diameters of $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$, and 2 inches.

Available in all types of Hercules® dynamite, these long-length, small-diameter cartridges are now in full production.

"King-Size" cartridges make possible a more uniform fragmentation through the discharge of a single column of explosive. Their use means substantial savings in valuable time and labor in loading holes.

Hercules designed, tested, and installed special new packing machines for these "King-Size" cartridges.

Our technical service and sales representatives will be glad to discuss with you how these "King-Size" cartridges can go to work for you.

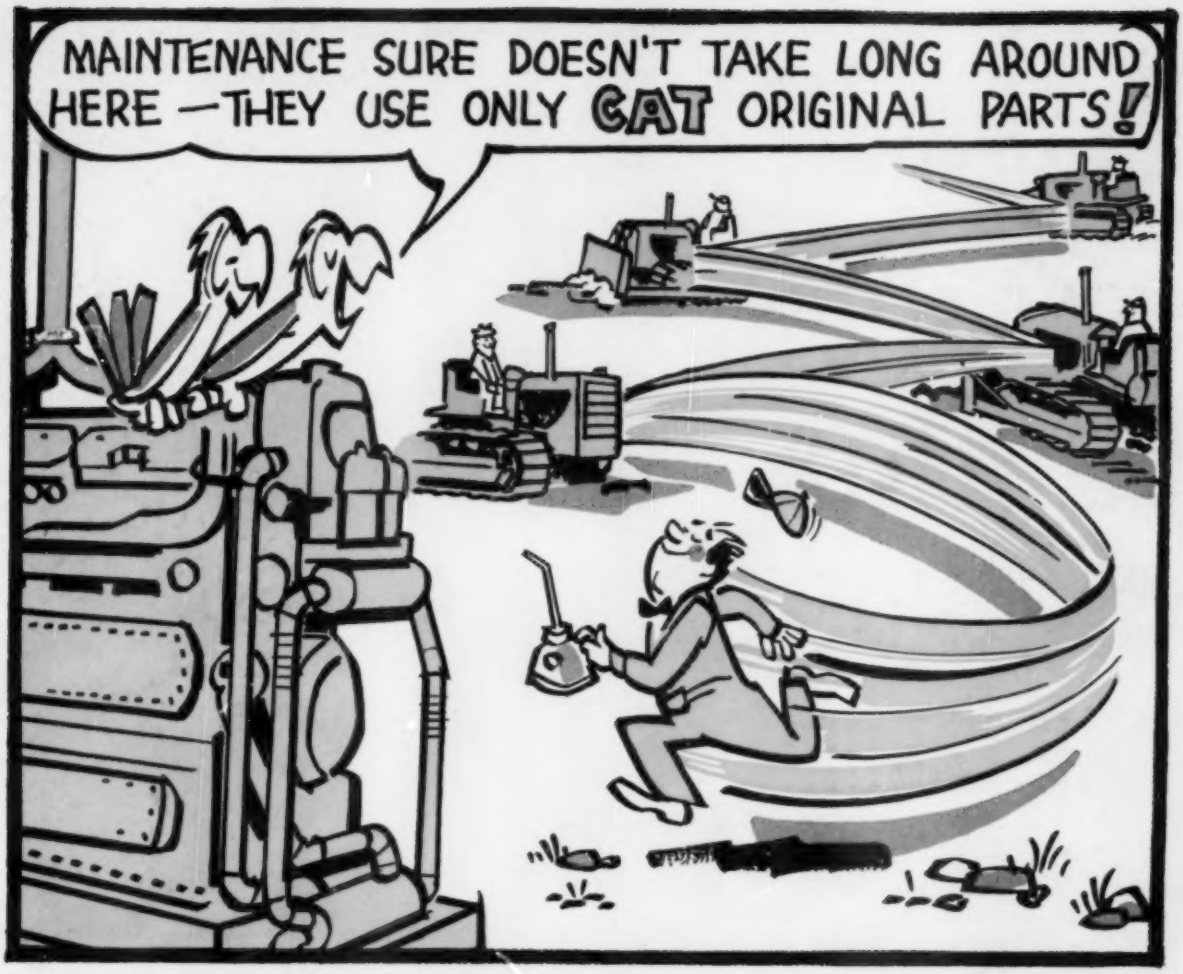


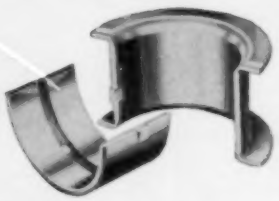
THREE TIMES AS LONG ... Here is one of the new "King-Size" Hercules cartridges—24 inches in length, shown alongside the same grade in the conventional 8 inch size.

HERCULES

HERCULES POWDER COMPANY
INCORPORATED
Explosives Department, 972 King St., Wilmington, Del.

Birmingham, Ala.; Chicago, Ill.; Duluth, Minn.; Hazleton, Pa.; Joplin, Mo.; Los Angeles, Cal.; New York, N.Y.; Pittsburgh, Pa.; Salt Lake City, Utah; San Francisco, Cal.





An engine bearing—not big, but mighty important. If it's a CAT* bearing, it's an *exclusive combination* of aluminum alloy—extra strong with just the right degree of hardness. But if it's a "look-alike" bearing—who knows?

Be sure to get parts you can trust—from your Caterpillar Dealer. He always has the *exact* part you need. Play it safe—don't be fooled by "look-alikes."

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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